



Area-based targeting of fuel poverty - an empirical evaluation

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Tackling Fuel Poverty in Northern Ireland

An Area-Based Approach to
Finding Households Most in Need

Christine Liddell and Paul McKenzie



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Deputy First Minister**

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Executive Summary

Following the publication of Northern Ireland's first independent Review of Fuel Poverty (Liddell, Morris, Rae & McKenzie, 2011), the Department For Social Development in Northern Ireland expressed an interest in exploring mechanisms for targeting Northern Ireland's Fuel Poverty Strategy towards households most in need. The University of Ulster responded to an Open Call for research proposals, published by OFMDFMNI's Research Branch under the Equality and Social Need Research Strategy. The application was successful and funding was granted from the OFMDFM Research Budget, which enabled a targeting pilot to be launched. Funding commenced in early 2012, and this report comprises the final report on the project's progress.

In collaboration with 19 local Councils, an area-based approach to targeting was tested. GIS-based systems mapped data from a wide variety of sources through the application of a weighted multi-dimensional algorithm. The algorithm calculated both fuel poverty risk in small areas of 125 households, as well as Warm Homes eligibility in these small areas.

To test the accuracy of the results, a total of 2,145 households were comprehensively surveyed and assessed in terms of their actual levels of fuel poverty and their audited eligibility for DSDNI's Warm Homes scheme. A conservative estimate of the targeting system's accuracy suggests that at least 34% of houses that were contacted proved to be eligible for free energy efficiency measures under Northern Ireland's Warm Homes scheme.

Whilst the Northern Ireland regional fuel poverty rate at the time was 42%, the targeting tool identified areas in NI which averaged 78% fuel poverty prevalence.

On the Scottish scale from 1 (*moderate* fuel poverty) to 3 (*extreme*), almost a quarter of the homes in fuel poverty were experiencing extreme fuel poverty.

Taken together, the results indicate that the targeting system devised here is currently the most accurate area-based tool available in the UK.

The targeting system was also compared with the current status quo for targeting viz. self-referral into the Warm Homes scheme via targeted leafleting. The area-based tool was found to be considerably more accurate, especially in avoiding false positives.

A wider rollout of the area-based approach was launched in June 2013, and is being tested using households drawn from 4 Councils.

Chapter 1 Background to Project

1.1 Fuel poverty in Northern Ireland

Fuel poverty is defined as follows:

“..a fuel poor household is one that cannot afford to keep adequately warm at reasonable cost. The most widely accepted definition of a fuel poor household is one which needs to spend more than 10% of its income on all fuel use and to heat its home to an adequate standard of warmth. This is generally defined as 20°C in the living room and 18°C in the other occupied rooms – the temperatures recommended by the World Health Organisation.” (UK Fuel Poverty Strategy, 2001).

Northern Ireland has the highest prevalence of fuel poverty in the UK (see Table 1.1), and one of the highest in the EU, with the current estimate indicating that 42% of households in Northern Ireland are experiencing fuel poverty (NIHE, 2013).

There are many reasons why Northern Ireland should have such a high predominance of fuel poverty, but the principal driver has been demonstrated to be the region’s reliance on oil for domestic heating (Liddell, Morris, Rae & McKenzie, 2011). More than three-quarters of households in Northern Ireland use oil as the most common method to heat the home (NIHE, 2013) due to the under-development of a natural gas network. The oil dependency culture of this region, and concomitant high fuel bills for heating, make the region particularly at risk of fuel poverty. To tackle this high level of prevalence, Northern Ireland has relied primarily on a government-led Fuel Poverty Strategy, the last iteration of which expressed an interest in targeting assistance most towards those households that were in greatest need i.e. households experiencing the most severe fuel poverty.

Table 1.1. Number and proportion of fuel poor households by country (DECC, 2013)

Country	Number (millions)	Percentage	Year of estimate
England	3.20	15%	2011
Scotland	0.58	25%	2011
Wales	0.37	29%	2011
Northern Ireland	0.29	42%	2011

*“A primary aim of the Fuel Poverty Strategy is to target available resources on those vulnerable households who are most in need of help”
(Northern Ireland Fuel Poverty Strategy, 2011).*

1.2 From Fuel poverty to Affordable Warmth

Affordable warmth is the ability to heat a home to an adequate level for household comfort and health without incurring financial hardship. The term “affordable warmth” is gradually replacing the concept of “fuel poverty”, which many consider to be stigmatising. Affordable warmth is also more harmonious with the combined agendas of climate change and fuel poverty, allowing for improved synchrony between these related areas of carbon reduction and energy efficiency.

1.3 Local authorities and Affordable Warmth Strategies – policy context in GB

The Home Energy Conservation Act (1995) aimed to encourage local authorities to develop Affordable Warmth Strategies, by requiring them to produce an annual energy conservation report. The aim of this was to reduce domestic energy consumption by 30% by 2011. Almost ten years later, this “encouragement” was given more structure in the Sustainable Energy

Act (2003) and the Energy Act (2004), with more specific targets being set for individual local authorities in England, Scotland, and Wales. The 2011 Energy Act has, to some extent shifted attention away from Councils and towards energy suppliers and home-owners, in the formulation of both the ECO and the Green Deal. The same transfer of responsibilities did not take place in Northern Ireland, where responsibility for delivery of the Fuel Poverty Strategy remains with regional government, explicitly with the Department for Social Development NI.

Nevertheless, a clear role for local governments throughout the UK was set out in the White Paper of 2009 (UK Low Carbon Transition Plan: National Strategy for Climate and Energy) which states that:

“People should increasingly be able to look to their local authority not only to provide established services, but also to co-ordinate, tailor and drive the development of a low carbon economy in their area, in a way that suits their preferences” (DECC 2009).

The Carbon Plan (DECC, 2011) confirms that commitment:

“Tackling climate change and demonstrating leadership through action is the responsibility of every part of government, central and local, and the wider public sector”.

By 2009, over 340 local authorities in GB had signed the Nottingham Declaration, which “commits the signatory authority to developing

plans to address the causes and impacts of climate change according to local priorities” (DECC, 2009). By 2010, at least 147 local authorities in England had developed climate change strategies (Swaffield & Bell, 2010).

In response to the Home Energy Conservation Act and many other Acts and Bills related to fuel poverty and climate change, local authorities in England, Scotland and Wales have developed and revised a variety of locally produced Affordable Warmth (AW) Strategies. In so doing, they have recognised the many services that interlink around the concept of AW. These include:

- a) the services they themselves provide to residents in their area i.e. in their capacity as a local authority;
- b) the services provided by other non-commercial stakeholders (including government departments and NGO's);
- c) large and small commercial enterprises that offer services, such as plumbers, manufacturers, and energy suppliers.

As a consequence of these networks of fuel-poverty-related services, most local authorities have sought to build an AW Strategy through partnerships, drawing together the skills and services of a wide range of agents already engaged in tackling fuel poverty. The local authority's own AW Strategy is thus envisaged as the hub around which fuel poverty actions are centered, offering new

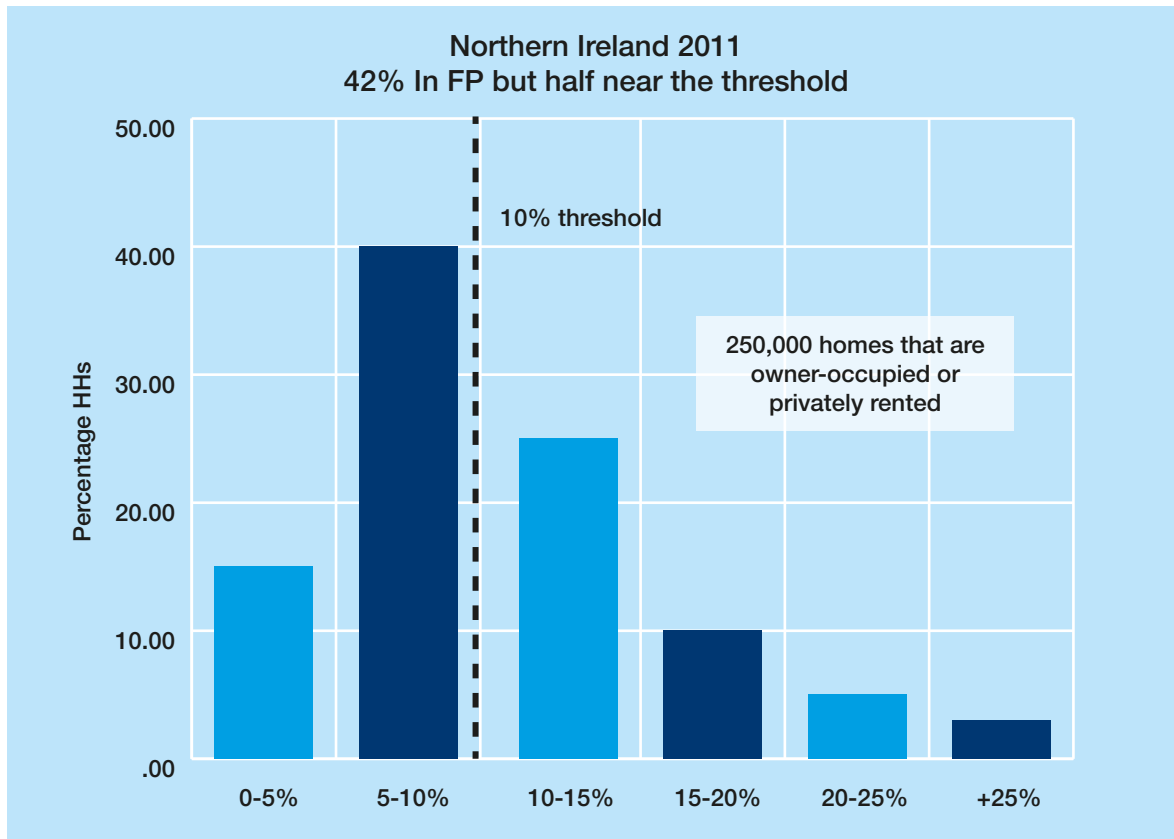
opportunities for networking, economies of scale, and the sharing of best practice.

1.4.1 Northern Ireland policy context and the rationale for the present research project – Department for Social Development policy

Strategy action in Northern Ireland to tackle fuel poverty has been primarily focused on improving energy efficiency in homes, and enhancing the quality of insulation and heating systems (Heffner & Campbell, 2011). Many of the schemes that have been put in place have relied heavily on the self-referral method. Despite a proactive approach to tackling fuel poverty, government departments have found it increasingly difficult to assist households due to a low level of self-referral from these households. Finding other ways to target fuel poverty measures, so that those most vulnerable can be assisted, has become an increasing priority. The need for better targeting was further highlighted by the publication of the NI Audit Office report on fuel poverty, which concluded that 30% of investment from Warm Homes had been directed towards households that were not in fuel poverty at all (NIAO, 2008).

In 2011, the Department for Social Development NI commissioned an independent review of fuel poverty in the region– how it is defined and how it is tackled. This was carried out by researchers from the

Figure 1.1. Distribution of Northern Ireland households according to their need to spend on heat and light. (Source: Liddell, Morris, Rae & McKenzie, 2011)



University of Ulster (Liddell, Morris, Rae & McKenzie, 2011). It concluded that the distribution of households in fuel poverty was skewed, with the majority of NI households being located around the 10% threshold which defines households as being either in or out of fuel poverty (see Figure 1.1).

This independent review was able to demonstrate that, of those in fuel poverty, a total of 32,000 households in Northern Ireland were in either severe (15-20% needs to spend) or extreme (>20% needs to spend) fuel poverty. This represents

more than 11% of all households that are in fuel poverty – a substantial minority.

On launching this independent review, the Minister for Social Development, Minister Nelson McCausland, set a challenge for future investigation, which was later elaborated on by his Department in the following terms:

- If you can count those most in need, can you also find them?
- If you *can* find them, can you find those likely to be:

- in the most extreme fuel poverty
- and also eligible for Warm Homes
- and preferably in clusters?

To address this series of questions, the University of Ulster applied to OFMDFMNI's Equality and Social Need Research Programme for funding to develop an advanced area-based targeting mechanism drawing on:

- the findings of UU's 2011 independent review of fuel poverty in Northern Ireland
- GIS mapping tools
- complex combinations of demographic data
- supplemented with local District/City/Borough Council knowledge.

The application was successful, and this report details the results of the completed 16-month project.

1.4.2 Northern Ireland policy context and the rationale for the present research project –OFMDFMNI policy

The Office of the First Minister and deputy First Minister Northern Ireland (OFMDFMNI) contributes to and oversees the co-ordination of NI Executive policies, sustaining efforts that can foster a peaceful, fair, equal and prosperous society. As part of this role, OFMDFMNI supports research that informs policy making, giving particular emphasis to promoting the collation of robust

and scientific evidence bases; these can often underpin existing good practice, and can also guide transformations in public policy and administration where needed.

The Office recently launched its *Delivering Social Change* framework, which is designed to encourage measures that tackle poverty and social exclusion effectively. Among the target groups of particular interest in this framework are “*children, older people, and people with disabilities*”; these reflect in part the concerns of Section 75 of the Northern Ireland Act 1998, which places a statutory obligation on public authorities to promote equality of opportunity regardless of age, disability, dependency, and several other individual and group diversities.

Furthermore, the framework's Social Investment Fund nominated “*physical regeneration of deprived areas*” as an area of special interest for the Fund. Taken together, this joint focus on particular vulnerable groups *and* physical regeneration meant that new solutions aimed at improving the delivery of DSDNI's Fuel Poverty Strategy fell squarely within the framework's declared remit.

At the same time, the proposed project could, potentially, inform several aspects of the Executive's Public Service Agreements, all of which were of “primary or substantial interest” to OFMDFMNI as part of their 2012/2013 Departmental Plan :

PSA 7: Making people's lives better

PSA 21: Enabling efficient government

PSA 6: Children and family

PSA 12: Housing regeneration and community development

PSA 20: Improving public services

Additionally, the Social Investment Fund was designed to *reduce duplication and share best practice*, aims which were reflected in the current proposal's plan to bring local authorities, Warm Homes Scheme Managers, and DSDNI teams together to develop new methods of joint working.

As a pilot proposal, the current project also fitted well with the Social Investment Fund's interest in identifying areas for intervention, rather than individuals. The Fund also had a declared commitment to programmes that *"could be replicated in other areas, and that were additional or complementary to what is currently provided to communities"*. In this context, the current proposal fulfilled all of these criteria, being:

- area-based,
- capable of going to scale rapidly (if successful),
- designed to sit beside, rather than to replace the status quo for self-referral which the Warm Homes scheme had always relied on.

As the project progressed, many of the areas which the Social Investment Fund had originally designated as potential Investment Zones for support were drawn into the project, including Belfast, Ballymena, Carrickfergus, Larne, North Armagh, Newry & Mourne, Armagh, and Fermanagh. The project fostered a new *coordinated* cross-Council modus vivendi for tackling fuel poverty that was jointly supported by OFMDFM, DSDNI, NIHE and DARD. In this sense the proposal, once funded, allowed an opportunity to participate in transforming NI's Fuel Poverty Strategy (hitherto the domain of DSDNI) into a joint programme of work which could make significant impacts on physical degeneration in areas most in need. As a result of the efforts made by local authorities, the University of Ulster, and stakeholders from all of these Departments, this was an opportunity which was fully realized in the short space of 16 months.

Chapter 2 The Area Based Approach Applied to Northern Ireland

Geographical identification draws on the evidence that social deprivation is concentrated in certain areas (Smith, 1999). Implementing policy at area-level offers efficiency gains through economies of scale by using fewer resources to potentially capture a greater number of fuel poor households (Tunstall & Lupton, 2003). Elbers et al. (2007) describe how geographically targeted initiatives can reduce the costs of anti-poverty programmes by up to two-thirds. Such an approach is particularly suited to Northern Ireland, where official statistics state that around one in every two households is categorized as fuel poor (Walker et al., 2012).

- the adoption of area-based techniques in Council areas serving residents in England and Scotland
- the endorsement of it by leading experts in fuel poverty such as Brenda Boardman (Boardman, 2010)
- a more recent local endorsement of the approach by the Consumer Council of Northern Ireland

So far, area-based pilot schemes have been highly effective in capturing the fuel poor. In schemes such as 'Warm Zones', all households in a defined area are systematically assisted at the same time. Household needs are identified and appropriate solutions are applied through a holistic, partnership approach. The schemes do not wait for households to self-refer, but proactively visit every household in a known high-risk area (Sefton, 2004). Effective area-based anti-fuel poverty programmes have been implemented in Kirklees and Stockton. The former has also been the subject of an independent evaluation (Liddell, Morris & Lagdon, 2011).

However, area-based schemes tackling fuel poverty rarely provide an account of their rationale for choosing a specific area in which to intervene. The Kirklees Borough Council Warm Zone, for example, simply encompassed all houses in the Borough (with the exception of some remoter rural properties). In Northern Ireland, the area-based MARA programme is focusing on

2.1 The area-based approach

The area-based approach is designed to identify geographic clusters where there is a greater likelihood of fuel poor households. Potentially, it could offer opportunities for targeting fuel poverty reduction programmes more accurately towards those in severe or extreme fuel poverty; those most in need seldom self-refer into government support programmes, when compared with households that are better off (Walker et al., 2012). They are therefore, both more in need, and also harder to reach through traditional self-referral mechanisms.

There is increasing interest in area-based approaches to tackling fuel poverty, reflected in:

the 88 most deprived rural areas of Northern Ireland, although it is commonly acknowledged that fuel poverty and deprivation are not particularly well correlated (Liddell et al., 2011a); as a consequence, programmes such as MARA have sometimes experienced disappointing rates of referral to fuel poverty programmes (Deloitte, 2011).

For Northern Ireland, too, a difficulty thus far with area-based approaches has been *which areas to target*. In England, areas are usually as large as 5,000 households; in Northern Ireland this would generate much too large a cluster of houses, inevitably capturing a wide range of levels of fuel poverty. The Northern Ireland House Condition Survey (from which fuel poverty prevalence is officially estimated) relies on sample sizes which are too small to assist in targeting at a smaller area level.

The approach adopted by UU involved bringing into the frame – for the first time – data from sources other than the Northern Ireland House Condition Survey; these data have the advantage of being drawn from more comprehensive samples that permit targeting at COA level (i.e. targeting to clusters of 125 households).

Underpinning area-based approaches to targeting fuel poverty with this type of *a priori*, data-driven and evidence-based approach was deemed essential for Northern Ireland, which has previously been challenged by sectarian divides. Local Councils often remain divided

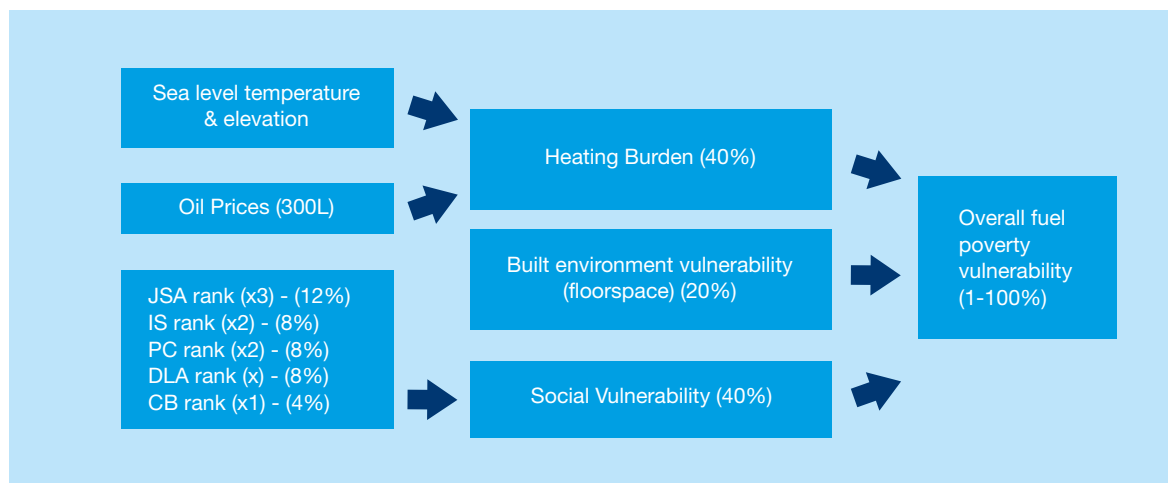
in terms of areas where local Councillors deem remedial work to be of greatest priority, rendering an objective targeting tool a vital component of any new approach.

2.2 UU's area-based approach (ABA)

The area-based tool which has been developed at UU allows for the building of a fuel poverty severity index based on a wide range of demographic, housing, energy, and household characteristics, defined at COA, or 125-household area, level. By utilizing newly emerging targeting tools which are available through GIS (Geographical Information System), risk scores are calculated from a weighted algorithm of 7 core demographic dimensions. By layering weighted data from this range of characteristics, it becomes possible to generate a multi-dimensional map representing fuel poverty risk at COA level.

Figure 2.1 (overleaf) illustrates the algorithm that was used for calculating fuel poverty severity risk and includes details of the weighting that was assigned to each element. Figure 2.2 illustrates the results of applying this algorithm, using Armagh City and District Council as an exemplar. Higher scores denote greater numbers of homes in extreme/severe fuel poverty.

Figure 2.1. Algorithm for calculating fuel poverty severity risk in Northern Ireland at COA level



Data can be mapped at this level of detail, but also at other levels of detail too, including SOA, District, and Ward level. At the largest scale, a map showing levels of fuel poverty risk can be produced for the whole

of Northern Ireland. This is illustrated in Figure 2.3, and depicts a regional profile for the 16 Councils who first agreed to participate in the present project.

Figure 2.2. Fuel Poverty vulnerability index at COA level – Armagh City and District Council

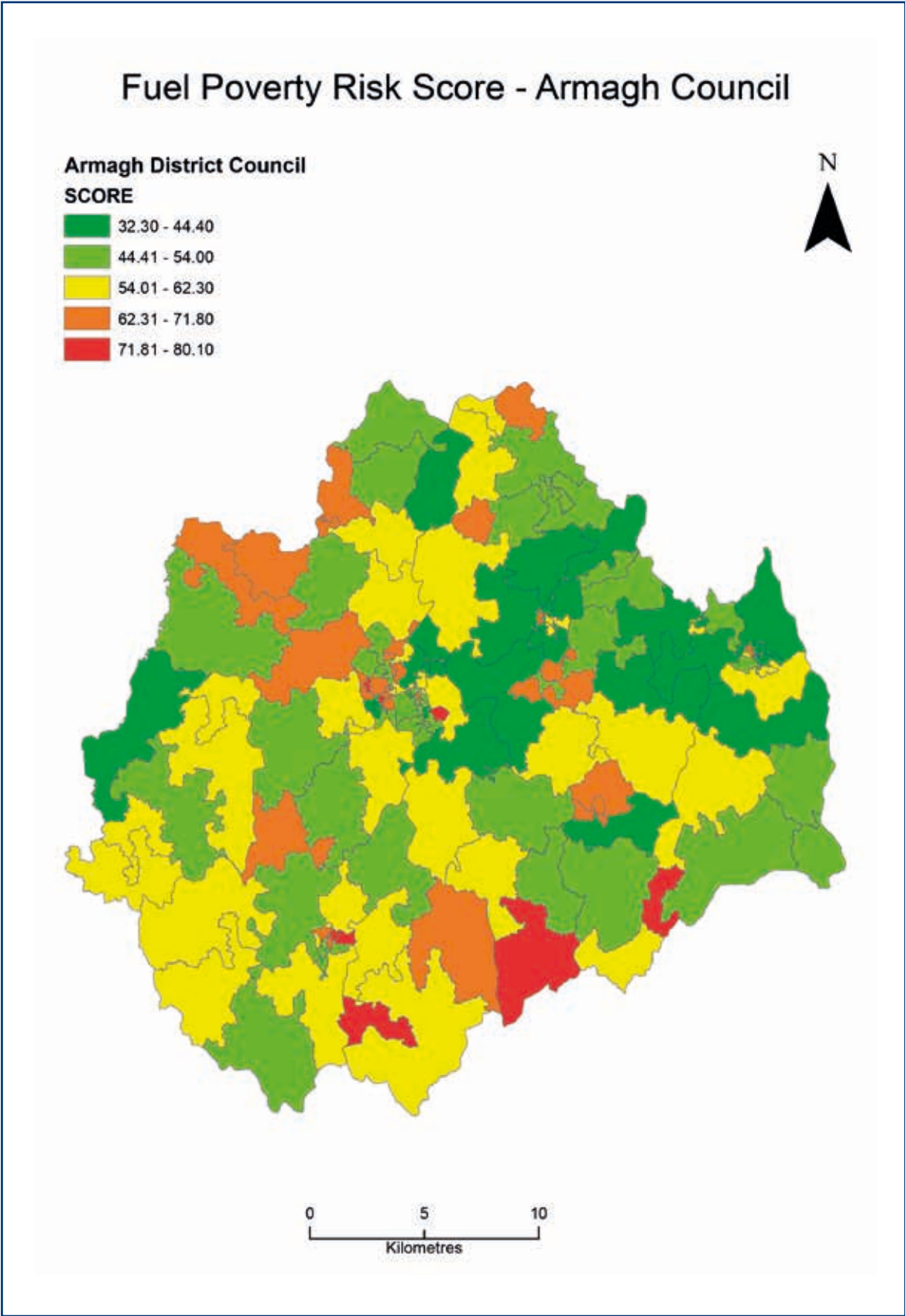
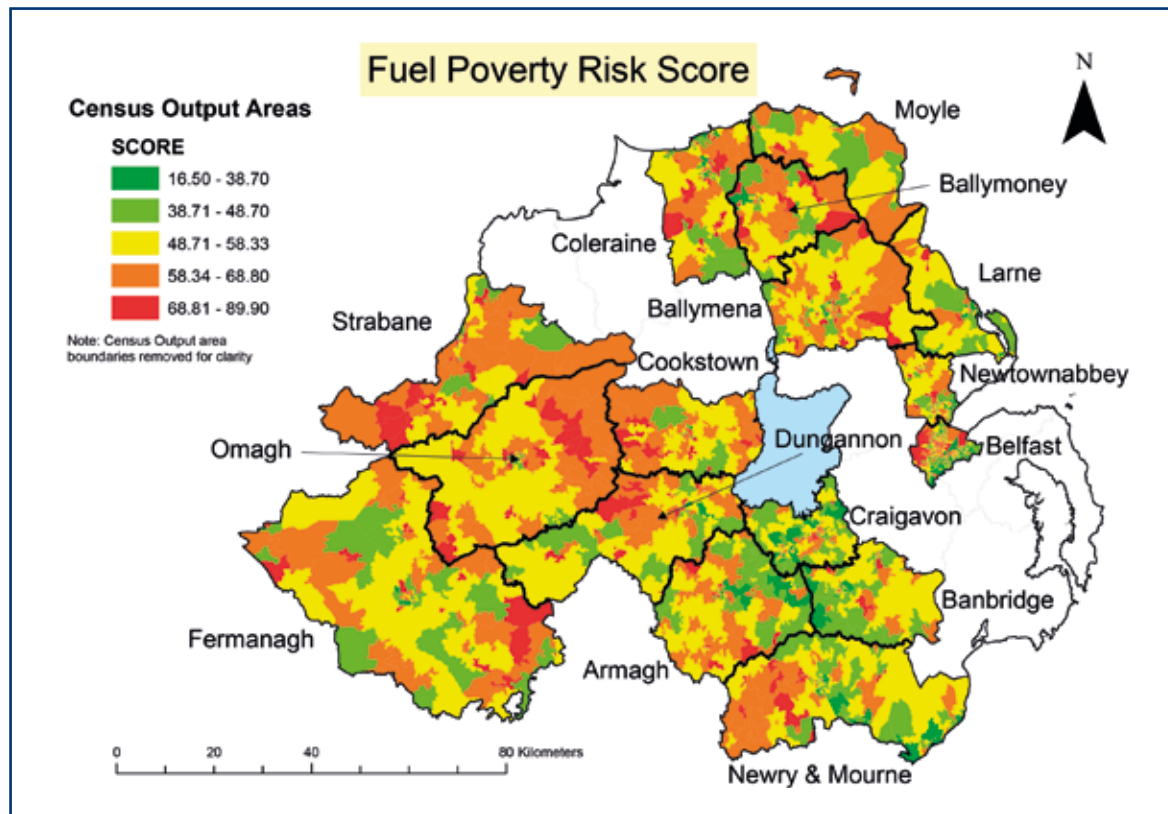


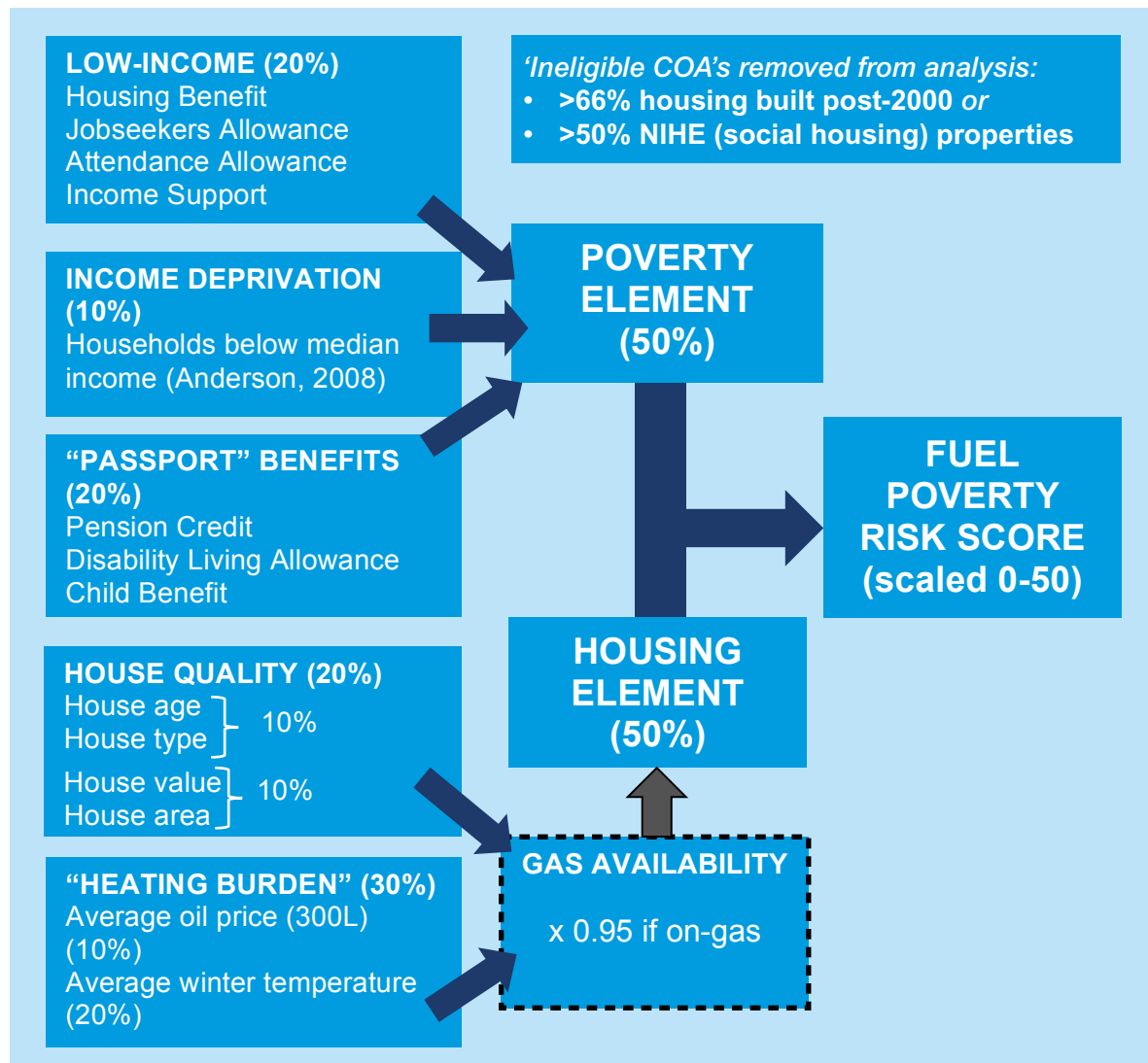
Figure 2.3. Fuel Poverty severity risk scores – map of 16 Councils in Northern Ireland



However, establishing clusters of severe and extreme fuel poverty was not the entire requirement for this project. DSDNI's request had been more specific. DSDNI wished to find clusters which had the greatest number of households in extreme/severe fuel poverty *who were also eligible for the Warm Homes Scheme*. This required three further layers of analysis in the algorithm:

1. The Warm Homes scheme is only available to owner-occupiers and people living in privately rented accommodation. Hence, COA's in which more than half of houses were owned by NIHE (i.e. were social housing) were excluded from the analysis altogether.
2. Newer housing is significantly more energy efficient than older housing, and post-2000 homes in particular have been built to a higher specification code for energy efficiency. Consequently COA's in which more than two-thirds of houses have been built post-2000 were excluded altogether from analysis.
3. Some areas of Northern Ireland have had a fairly comprehensive penetration of Warm Homes interventions, with as many as 15% of homes in some COA's already having been retrofitted as part of the Warm Homes 2001-2011 scheme. All COA's were, therefore weighted

Figure 2.4. Warm Homes Eligibility algorithm

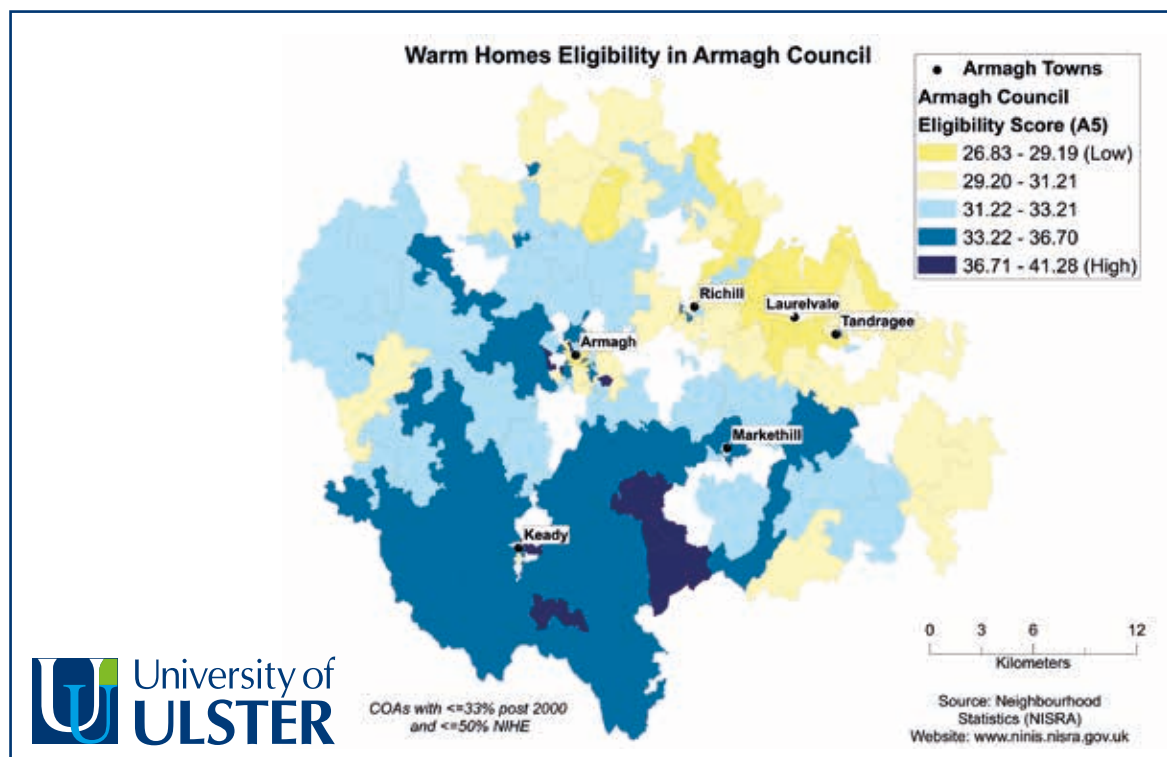


according to the extent to which Warm Homes had already become a significant presence.

In conclusion, the final algorithm was one which calculated

Warm Homes Eligibility rather than simply the severity of fuel poverty risk. Figure 2.4 provides details of this algorithm, and Figure 2.5 again uses Armagh City and District as an exemplar.

Figure 2.5. Warm Homes Eligibility – Armagh City and District Council



From maps like this it becomes abundantly clear which COA's would be most appropriate for area-based targeting. Mapping of this kind offers an objective and evidence-based guide for Councils, as well as local, regional and national governments for ensuring that any fuel poverty remediation work is carried out in areas of greatest risk, should they so wish.

2.3 Policy synergies

The construction and testing of algorithms such as these was concordant with OFMDFM's focus on collating robust and scientific information, since all of the elements contributing to the algorithm were drawn from pre-existing regional databases that could be accessed from organisations such as NISRA (Northern Ireland Statistical Research Agency), Land and Property Services, and The Meteorological Office.

Furthermore, the Warm Homes eligibility criteria, which ensured that the programme of intervention was confined to households containing children, people living with a disability, or older people, dovetailed well with OFMDFM's overarching interest in tackling poverty in these particular demographic groups.

The fact that Warm Homes was specifically focused on housing improvements that contributed to the overall energy efficiency of housing stock was, in addition, synergistic with OFMDFM's Social Investment Fund's special interest in the physical regeneration of deprived areas. Finally, being area-based, the approach also had potential for enhancing *community* development, not only household living conditions.

Chapter 3 Research Proposal

3.1 Aims

Given:

- a) an escalating prevalence rate of fuel poverty when measured through UK indicators
- b) reluctance among some who are in extreme need to accept assistance, and
- c) difficulties in identifying households in greatest need

the current Fuel Poverty Strategy may require new models that can explore:

1. A targeted approach which will identify those who are not only eligible for Warm Homes and similar programmes but who are also in severe fuel poverty.
2. Approaches which can effectively de-stigmatise these households, so that vulnerable clients feel more able to participate in schemes that are designed to assist them in achieving adequate standards of warmth.

3.2 Project objectives

Objective 1: To introduce an area-based approach to targeting fuel poverty in Northern Ireland as a supplementary approach which (depending on its performance) might become an accepted means of recruiting more severely fuel poor households into government assisted programmes.

Objective 2: To compare the targeting efficacy of this area-based approach with that achieved using

the more traditional self-referral methods by which individual households have been targeted in previous years.

3.3 Agreed scope and methods

Objective 1: Targeting areas with highest likelihood of severe fuel poverty.

Through GIS, it was agreed that a combined risk index for fuel poverty would be calculated and mapped at COA level, using an evidence-based weighted algorithm. From this, a further series of refinements would generate an “Eligibility For Warm Homes” index at COA level.

Pilot implementation in areas of greatest risk would take place in 4 or more Councils, chosen strategically, to foster collaboration between experienced and less experienced teams for delivering an areas-based approach. District and Borough Councils would act as the principle facilitators for operationalising the areas-based approach. Each Council would nominate their preferred parameters from the Census or other databases, and the University would build a series of local severity maps based on their priority parameters (within the boundaries set by the 2011 NI Fuel Poverty Strategy).

It was agreed that delivery of the areas-based approach to priority areas would follow the Kirklees Zip-Up Method model which involves training a small team of home visitors (enablers) to carry out home visits in the targeted COA's.

Objective 2: Setting baselines and monitoring targeting efficacy over time

It was agreed that GIS would be used to:

- a) assess the targeting accuracy of the current model of recruitment (i.e. self-referral through callers contacting fuel poverty agencies such as Bryson Energy and NEA NI).
- b) monitor targeting efficacy over time, for both the current self-referral system and the proposed area-based system.

3.4 Outputs and outcomes

Objective 1: Targeting areas with highest likelihood of severe fuel poverty.

1. A regional risk index for fuel poverty for Northern Ireland, presented at COA level, and based on a uniform algorithm. Further translated into Warm Homes Eligibility scores.
2. Four tailored risk indices to be prepared, one for each of four Council areas and based on each Council's nominated parameters.
3. Training of Council delivery teams.
4. A pilot roll-out of the COA-level area-based approach in the 4 Councils.

Objective 2: Setting baselines and monitoring targeting efficacy over time.

A multivariate analysis of the targeting accuracy of the current model of recruitment based on Warm Homes installation data 2000-2011.

On-going monitoring of targeting accuracy for new installations under Warm Homes via self-referral and area-based models.

A cost-benefit analysis of the two models of delivery i.e. self-referral and area-based targeting, based on the first year of the Objective 1 pilot.

3.5 Quarterly deliverables and milestones

Quarter 1: January 15th to March 1st 2012

- Establishment of cost code and invoicing procedure
- Appointment of Project Steering Group (PSG)
- Recruitment of Researcher and temporary research assistants
- Convening of first meeting of the PSG (February 2012)
- Selection and recruitment of 4 participating Councils
- Agreement of a three-month plan of action for Quarter 2
- First approaches made to Council areas
- Co-opting of Council representatives onto PSG
- Development and testing of home survey materials
- Interim report completion

Quarter 2: April 1st to June 30th 2012

- Researcher commences full-time work on Project 1st April 2012
- Database building for all participating Council areas from Census and other sources
- Presentation of standard algorithm outcomes to all 4 Council areas
- Second PSG meeting (May 2012), including sign-off on survey instruments
- Agreement on additional data to be added to database for each Council area
- Agreement on algorithm for each Council area
- Re-drawing of outcomes for targeting, to include Council's own data
- Interim report completion

Quarter 3: 1st July to 30th September 2012

- Agreement on plan of action for recruiting households in each Council
- Training of delivery teams and on-going support for these teams
- Testing and roll-out of delivery protocol
- Home visits to households in target areas
- Referral onwards to other agencies

- Third PSG meeting (August 2012)
- Debriefing of home visit teams fortnightly, for recalibration purposes
- Amendments and additions to home visit protocol as needed from debriefing sessions
- Interim report completion

Quarter 4: 1st October to 31st December 2012

- Fourth PSG meeting (November 2012)
- Completion of all home visits and referrals by Council teams
- Final debriefing of home visit teams
- Objective 2: Building of Warm Homes installation database (2000-2012)
- Workshop organisation and conference participation
- Interim report completion

Quarter 5: 1st January to 31st March 2013

- Evaluation of results from Objective 1
- Analysis of Warm Homes installation database (2000-2012)
- Fifth PSG meeting (February 2013)
- Comparison of targeting efficacy of area-based and Warm Homes installations
- Interim report completion

Final phase: April 1st to May 31st
2013

- Final analyses and report write-up for Objectives 1 and 2
- Final PSG meeting (May 2013)
- Workshop organisation and conference participation
- Final report writing and submission

Chapter 4 Narrative Account of Project's Progress and Results

4.1 Scale of project

The project initially planned to work with 4 Councils. Ultimately 19 Councils asked to participate, and all were accommodated. One of these Councils did not, ultimately, go ahead with full participation, so data are based on results from 18 Councils in total. The impact this escalation from 4 to 18 Councils had on workload and the practical delivery of the project must be

noted, but the expansion became a valuable opportunity. It is unlikely that a “4 Councils approach” would have given an accurate picture of the potential problems of a wider roll-out. Many of the key points for improvement probably only came to light because of the much larger scale of execution.

Figure 4.1 provides a summary of the project's overall timeline.

Figure 4.1. Summary of the project's timeline



4.2 The targeting algorithm

The maps generated to identify areas for targeting revealed a distinctive typology of extreme fuel poverty:

- Low income households in energy inefficient homes of low value-cheaper and easier to treat
- High income households in energy inefficient homes of high value-more expensive and more difficult to treat.

The two are usually clustered separately in NI i.e. they are located in different COA's. One of the first tasks for Councils (usually delegated to their Councillors), was to decide whether they wished to choose COA's from both or only one of these typologies. In most cases, Councils elected to tackle COA's of low income.

During the course of the project, the algorithm and methodology deployed in this project were peer reviewed and published (See Figure 4.2, opposite).

4.3 The Household survey

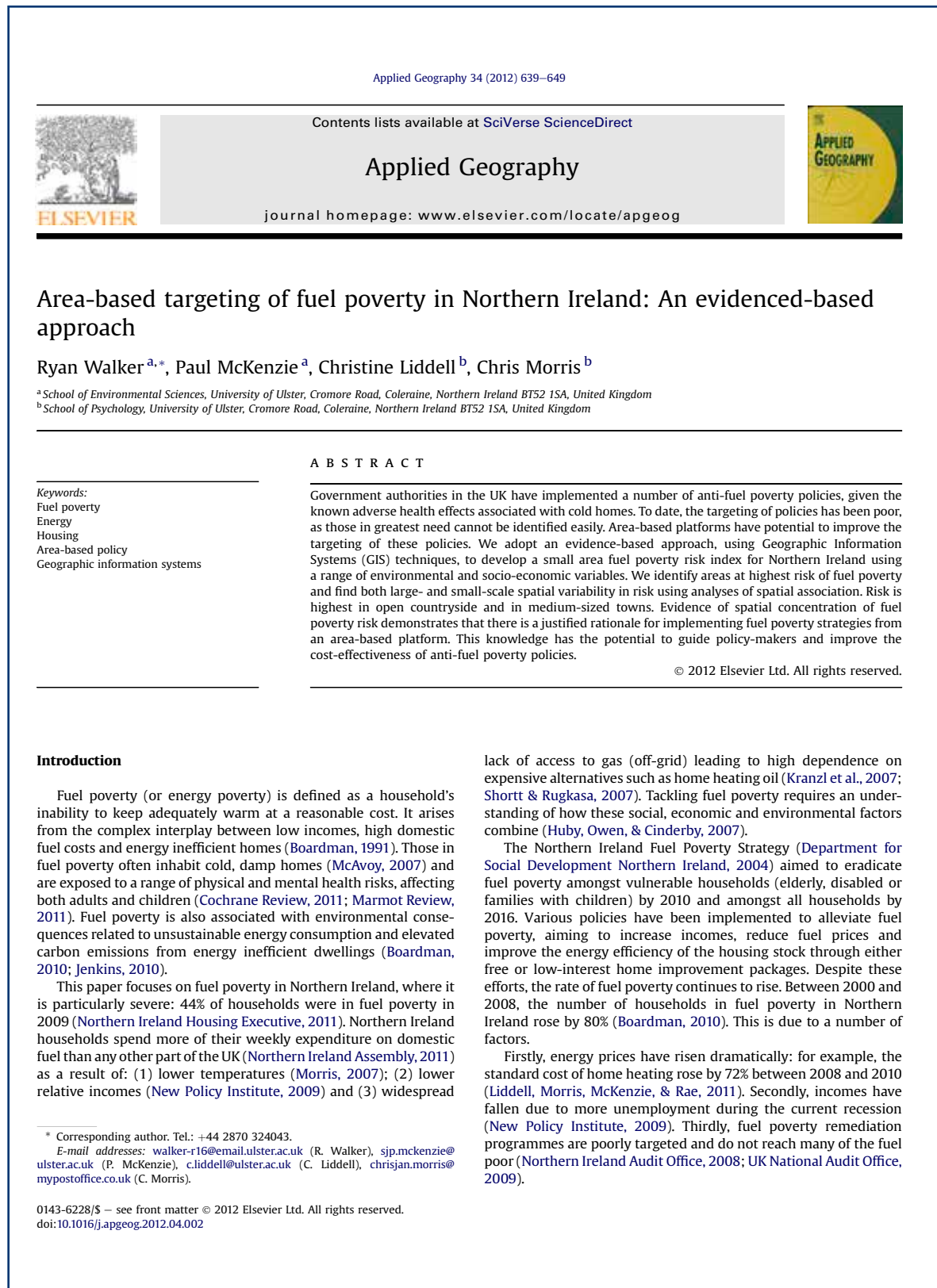
Whilst it was not stipulated as part of the OFMDFM project, DSDNI requested that UU compile a Survey that could be carried out with households who agreed to take part in the project. They hoped that this Survey would :

- acid-test the targeting accuracy of the new GIS-based system, whilst also
- gathering new data on the circumstances of people living in severe to extreme fuel poverty.

It comprised the first Survey of its kind to be conducted amongst this particular demographic, and ultimately provided a wealth of valuable information for future planning.

The Survey was based on a variety of other documents, including the Warm Homes referral Survey, the Warm Zones technical survey that was used in England at that time, the NI House Condition Survey, and a variety of energy efficiency related scales and surveys. A copy of it, along with a copy of the client consent form, and the show cards used with clients when completing the survey, can be sourced from the authors.

Figure 4.2. Scientific paper based on the algorithm and methodology of the project



4.4 Results from the survey

Participants: In all but 6 cases (0.3%), the person who completed the Survey lived in the house, indicating that the responses obtained concerning the house and its condition were likely to be quite accurate. Later on, when technical surveys were carried out by Warm Homes agents, the high level of accuracy contained in most of the survey responses was confirmed.

Types of homes: Councils, on the whole, surveyed in areas where terraced homes predominated. 53% of the surveys were carried out in terraced properties, almost double the regional average for NI. Conversely, the number of detached homes surveyed was half that of the regional average (see Table 4.1, below).

The homes surveyed were relatively old, averaging 54 years. Most had 3 bedrooms.

Lofts: Almost every home (99%) had a loft space. A quarter (24%) of these were floored, with 7% of all lofts having been converted into living spaces. Owner occupier (OO)

and private rental (PR) homes were the same in terms of this pattern. However, more than half (52%) of private renters did not know whether their loft was insulated or not, and nearly a third (32%) of owner occupiers responded in this way too. In terms of the number who could provide information on their loft insulation, 5% of OO's had no insulation in their loft, rising to 8% in PR's; this is significantly greater than the House Condition Survey indicates for all households in Northern Ireland, where the "no-insulation" figure is 2% in both tenures. 28% of OO's reported having the recommended amount of loft insulation (200mm or more), less than was the case for PR's (19%). Again, these figures are below the regional averages for fully insulated lofts (40% for OO's and 32% for PR's).

Hence the homes surveyed:

- had a significantly greater than average risk of having no insulation in their lofts
- had a significantly lower than average risk of having lofts that were fully insulated.

Table 4.1: Types of homes surveyed

	Detached	Semi-detached	Terraced
Surveyed	21%	26%	53%
NI average 2011*	42%	22%	28%

* NIHE, 2011

In total, 73% of households who could provide information on their loft insulation status needed retrofitting. Given a substantial number of respondents did not know whether they had loft insulation or not, this was probably an underestimate of need.

Heating: The survey indicated that

- Almost all of the extreme fuel poor rely on oil for their main heating system
- Only a quarter of these shopped around for the best price before purchase
- Almost all have central heating, and a system which can be thermostatically controlled
- 40% of systems are more than 15 years old, including boilers
- And 6% have main heating systems which are broken.

5% of homes surveyed were without a functioning main heating system in their homes because of the system being faulty. This was twice as likely to be the case among private renters (4% OO's and 8% PR's). In total 102 of the homes surveyed required a repair to their main heating system as winter 2013/4 approached. Most importantly, the majority (65%) of households reported that their main heating systems were not sufficiently powered to provide all-year-round warmth. As a consequence, they were burdened with two rather than one heating bill in the colder months of the year, the second bill usually

being for an electric heater or heaters, or a coal fire. It is likely that these additional costs contributed substantively to their status as households in severe or extreme fuel poverty.

Demographics of severe and extreme fuel poverty: The surveys provided invaluable information in this context:

- Half of households targeted lived in rural areas
- 72% of houses in high risk areas were more than 35 years old, with more than half the occupants being 60+ years
- Almost 60% were terraced or semi-detached
- People were on predominantly low incomes, i.e. half of the households surveyed had an income less than £12,000 p.a, and two-thirds had an income of less than £16,000 p.a
- 90% used oil fired heating systems with 14% of oil users sometimes relying on 20 ltr drums.

On the basis of income and energy needs, it could be confidently estimated that the majority of households contacted during the Survey were in severe or extreme fuel poverty, according to the formal definition of these terms i.e. they would have needed to spend in excess of 15% of their income in order to attain a safe standard of heating and other domestic energy in their homes.

4.5 Targeting efficacy of the area-based algorithm

Table 4.2 provides summary data by participating Council. Figure 4.3 shows the outcomes of targeting as of May 2013 from data for 2,141 households in target areas. (2,145 surveys were collected, with 4 households requesting that their data be held only by their local Council).

At first pass (see Figure 4.3), 51% of all households surveyed appeared to be eligible for Warm Homes assistance, with similar percentages being evident in all participating Council areas. Figure 4.3 also illustrates what happened thereafter.

Once technical surveys had been completed by the Warm Homes agents, the percentage of actual eligibles reduced from 51% to 34%, mainly because many households (13% of those likely to have been eligible for Warm Homes) could not be re-contacted by the agents (despite telephone calls and letters). A few households had to be excluded because they had provided incorrect information in the Council survey (4%) which meant that they were not, in fact, eligible for Warm Homes. Most of these were living in homes that were being privately rented, and so were less likely to be familiar with the status of lofts, boilers, etc. Hence, one in 3 households were, eventually, able to be offered free Warm Homes measures. A further loss of participation resulted from 8% of those who were offered measures

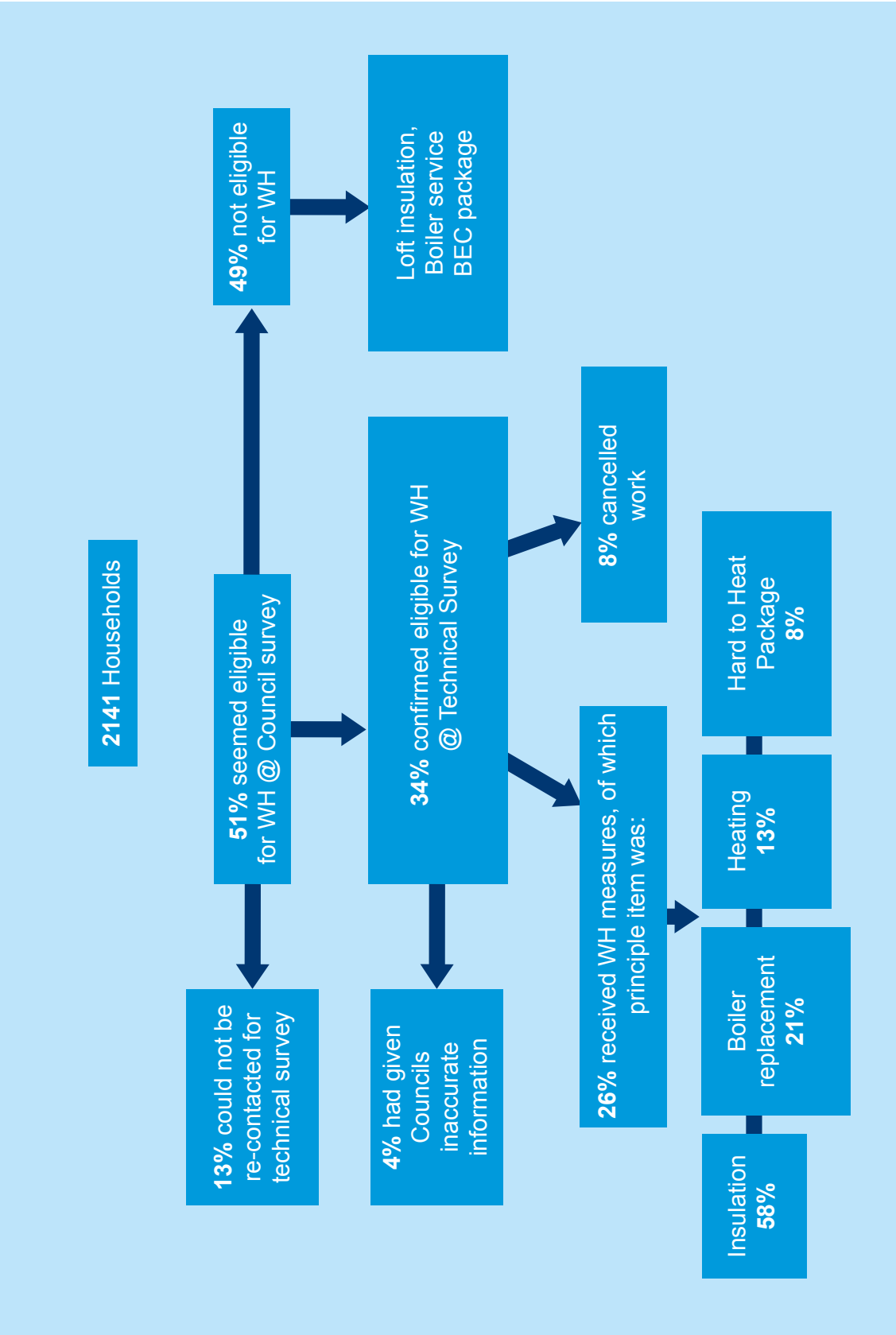
cancelling the job. In total, therefore, the scheme was able to provide actual measures to just over 1 in 4 homes (26%) surveyed by the Councils. As is also illustrated on Figure 4.3 the majority of these either received a primary measure which comprised insulation, and/or a boiler replacement.

Those who were not eligible for Warm Homes were able to avail of free loft insulation and a boiler service which DSDNI provided, ensuring that all households who completed a Council survey received some energy efficiency measures as well as a free benefit entitlement check from the Social Security Agency.

Table 4.2. Initial results for targeting success rates by Council – prior to technical survey by Warm Homes agents

Council	Questionnaires Completed	Potential Eligibility for Warm Homes	% Potential Eligible for Warm Homes
Armagh	71	49	69%
Ballymena	125	62	50%
Ballymoney	125	77	51%
Banbridge	128	61	48%
Belfast City	115	59	51%
Carrickfergus	124	73	59%
Coleraine	125	71	52%
Cookstown	125	71	57%
Craigavon	100	56	56%
Dungannon	125	72	58%
Fermanagh	125	69	51%
Larne	123	63	51%
Limavady	124	75	60%
Moyle	126	60	48%
Newry and Mourne	111	66	60%
Newtownabbey	125	63	50%
Omagh	125	62	50%
Strabane	125	64	51%

Figure 4.3. Outcome of Affordable Warmth Pilot, May 2013



4.6 Severity of fuel poverty in the households surveyed

Table 4.3 provides details of the estimated fuel poverty prevalence among the 2,145 households that were surveyed. This was calculated using an algorithm based on both the energy efficiency level of the house itself, and the circumstances of the people who lived in it, including:

- A wide range of housing energy efficiency data gathered during the Council survey (e.g. proportion of windows with double glazing, presence and depth of loft insulation, boiler type and age, etc.), translated into a U-value metric
- The number of people in the home relative to floor space;
- Income of the household (equivalised)
- Types of heating fuel being used and the cost of these (oil/gas/other)
- Electricity supplier's tariff and payment method discounts.

The algorithm was specially constructed for this Pilot, and it has, we believe, considerable potential to replace the NIHCS measure of fuel poverty over time. Since the NIHCS measure of fuel poverty is being based on ever-shrinking samples that have already made it difficult to calculate the numbers in severe and extreme fuel poverty in Northern Ireland, work on the development of an alternative metric may be useful in the longer-term.

The Table indicates that the *average* level of fuel poverty in 10 of the 18 participating Councils was classifiable as either severe (for 8 Councils) or extreme (2 Councils viz. Cookstown and Strabane). Overall, average needs to spend on heating and other domestic fuels in the 2,145 households surveyed across 18 Councils was 16%.

Table 4.4 classifies the households surveyed into conventional fuel poverty severity bands, as commonly used in Scotland. This indicates that only 22% of households surveyed by the Councils were not in fuel poverty i.e. 78% of all households surveyed by the Councils were experiencing some level of fuel poverty. This compares with a Northern Ireland wide average around that time of 42% (NIHCS, 2011). Clearly the attempt to find areas where fuel poverty prevalence was likely to be high, and severity also elevated, was successful in this Pilot.

Table 4.3. Estimated needs to spend on heat and other domestic fuels for households surveyed by Council area

Council	Average needs to spend on heat and other domestic fuels*	Council (continued)	Average needs to spend on heat and other domestic fuels* (continued)
Armagh	16%	Dungannon	15%
Ballymena	14%	Fermanagh	15%
Ballymoney	19%	Larne	13%
Banbridge	13%	Limavady	16%
Belfast	13%	Moyle	19%
Carrickfergus	13%	Newry/Mne	15%
Coleraine	14%	N'abbey	12%
Cookstown	21%	Omagh	18%
Craigavon	12%	Strabane	25%

*This comprises the classic 2000 UK fuel poverty indicator

Table 4.4. Severity levels of fuel poverty in the 2,145 households surveyed

	% Not in fuel poverty	% Fuel Poor NTS* 10.0%- 14.9%	% Severe Fuel Poor NTS* 15.0- 19.9%	% Extreme Fuel Poor NTS* 20.0- 24.9%	% Extreme++ Needs to spend 25% or more of income on domestic energy
All 18 Councils	22%	34%	25%	10%	9%

*NTS = Needs to spend

What is particularly notable about Table 4.4. is the fact that 19% of all households surveyed were experiencing the extremes of fuel poverty. As a proportion of all fuel poor in the sample, the extreme fuel poor represent a quarter of all those in fuel poverty. The data provide the first evidence of the depths of the current problem. In these targeted COA's almost a quarter of those in fuel poverty would have required 20% or more of all their income simply to attain a normal standard of heating and energy use at home.

4.7 Debriefing of Council teams

Once all Surveys had been completed by Councils, the Council teams who had carried out the work were invited to a review session held in Belfast on the 5th of March 2013. This was hosted by UU. Discussion highlights included:

- Some households refused the Warm Homes survey even though they were eligible (although some did go for a Benefit Entitlement Check). This

might stem from a perception that the installation of measures is a disruptive process.

- Some households (particularly the more elderly) may need support throughout the installation process, which could encourage them to take up measures (e.g. helping them to clear their attic space ahead of loft insulation, or offering to take them away for day activities whilst their house is retrofitted).
- Experience from the Northern Exposure project (Belfast based retrofit programme) shows how the attitude of workmen (hardworking, cleaned up after work was completed), can be a major positive for recipient households. Emphasizing this kind of information could be key in overcoming people's perception that installations are a major upheaval (Liddell & Lagdon, 2013).
- Personal circumstances at the time of the Warm Homes survey may also dictate a householder's

refusal of measures (e.g. ill-health, expecting a child, etc.). These circumstances may only be temporary, so these are households that could be brought back into the project at a later date. The project must not lose track of them (e.g. keeping them on a separate database). Analysis of other reasons why households refuse Warm Homes would be helpful.

- Early evening was found to be the best time for Council teams to carry out their home visits. This would have been facilitated if home visits had been carried out during summer time (with lighter evenings). The time of year (and darker nights) was highlighted as an important challenge to successful home access and survey completion amongst Councils.
- Some difficulties were encountered in gaining access to households. Fear is a real factor. Some residents who were at home at the time of visit would not come to the door for Council teams. The possibility of using community workers for home visits has been suggested. However, households who refused to be surveyed were sometimes encouraged to participate after talking with neighbours. The letter sent by Councils to households was found to be particularly effective in getting access, largely because the householder was expecting a visit.
- Community engagement before the scheme was launched in Council areas, would have been helpful. Time constraints in the pilot prevented this, but a future programme of work could build this element into its timeframe.
- The survey used in the Pilot was designed to be comprehensive in order to build up a profile of the types of households that were being missed by Warm Homes. However, only a few questions are actually required to determine eligibility for the scheme. A shorter survey tool is suggested for the next phase of the project, which the households could fill out themselves.
- It was also noted that involvement on the Pilot was a valuable experience for the placement students who collected survey data, in terms of professional development. Continued use of students for surveying and project involvement is recommended.
- Coleraine Borough Council has also chosen to target free Keep Warm packs towards homes that were noticeably cold when visited. This token was recommended for the next phase if feasible.

4.8 Wrap-up sessions hosted by DSDNI

In March 2013, DSDNI hosted their own wrap-up dissemination event at Crumlin Road Gaol in Belfast, which all Councils were invited to attend.

Both Minister McCausland and the DSDNI's Permanent Secretary, Will Haire, spoke at this event.

In April 2013, they also hosted a "further steps" seminar, at which they consulted all participating Councils about a way forward for the next stage of an area-based approach.

Overall, these after-intervention activities reflected the Project's interest in sharing good practice and in identifying ways of improving process. It also reflected the Project's focus on bringing all stakeholders together in a manner which could remove duplication or inefficiency, an ethos which is endorsed by OFMDFM's Social Investment Fund. At its end, the project could be seen as one which had successfully targeted areas that merited inclusion under OFMDFM's Investment Zones.

4.9 Analysis of the targeting accuracy of the Warm Homes 2002-2011 database

The Warm Homes database contained information on each Warm Homes installation undertaken in Northern Ireland between 2002 and 2011 (approximately 76,000 households). The 2002-2009 (58,868 households) data, contained the most detailed information, e.g. on the types of measures installed in each home, along with the cost of measures.

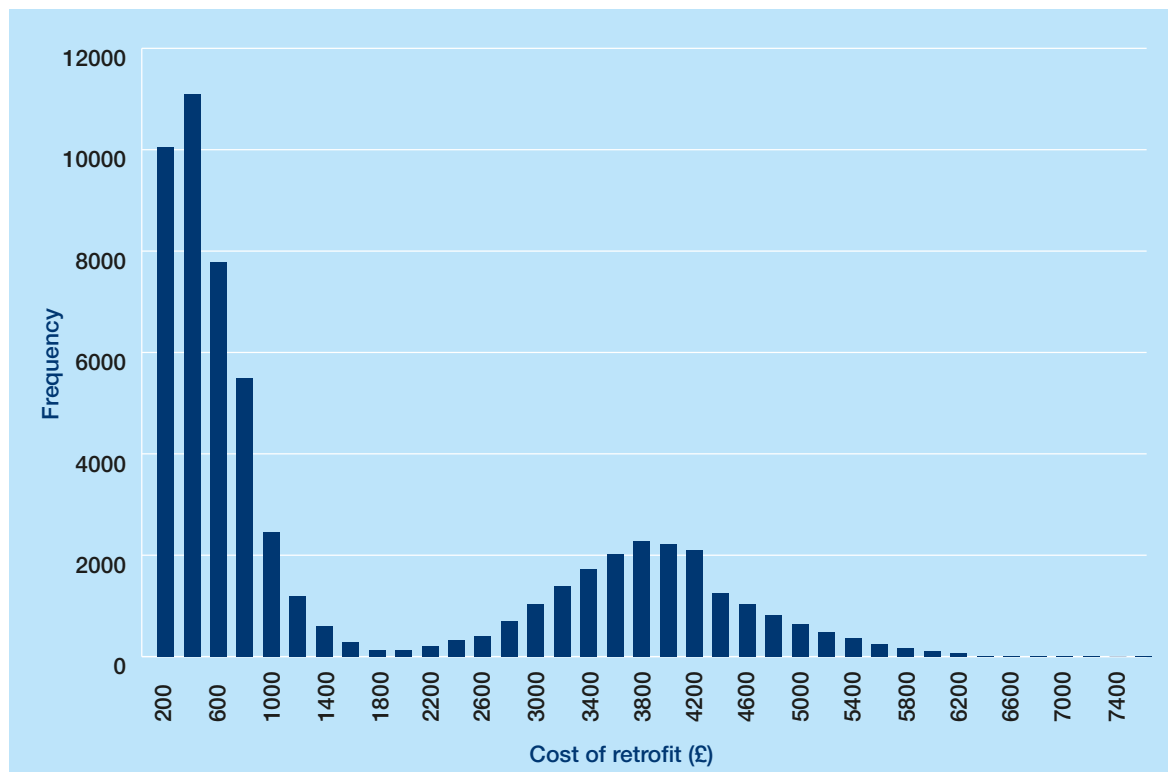
Fuel poverty mapping was used to evaluate the targeting efficiency of WH policy at small area level, using GIS as an objective performance

management tool. GIS techniques enabled us to identify areas of high and low WH penetration and assess how well WH has been targeted in small areas, based on the level of risk/need. Two efficiency measures were assessed (policy activity and expenditure) to assess the relationship between risk and amount of assistance. In other words, did areas of higher need receive a greater number of interventions and "deeper" (more comprehensive) retrofits? With effective targeting, one would expect above-average expenditure per household in high-risk areas, particularly in rural areas where solid-walled, inefficient households predominate (Baker et al., 2008).

Results indicated a heavy skew in terms of installations, the majority of which were costed at less than £800 (see Figure 4.4, overleaf). This raises questions concerning the extent to which Warm Homes installations have been able to achieve any deep and lasting effects on the energy efficiency of Northern Ireland's housing stock, or on the plight of the fuel poor who live in these houses.

The spatial distribution of Warm Homes installations across all Northern Ireland's 5,022 COAs is shown in Figure 4.5. Areas of highest WH penetration are found in Cookstown, Omagh and Newry & Mourne District Council Areas (DCAs) and areas of north and west Belfast. Lower concentrations are located in the East, in Carrickfergus and Larne.

Figure 4.4. Cost of Warm Homes retrofit work 2002-2011



More detailed spatial analysis showed a complex disparity in the distribution of WH interventions with some areas having significant targeting and others having received little or no assistance. Area maps of the cost of retrofits suggest higher expenditure in rural areas.

The complete analysis was written up as a scientific paper which was published in the journal *Energy Policy* in Summer 2013. (Walker et al., 2013).

4.10 Other comments

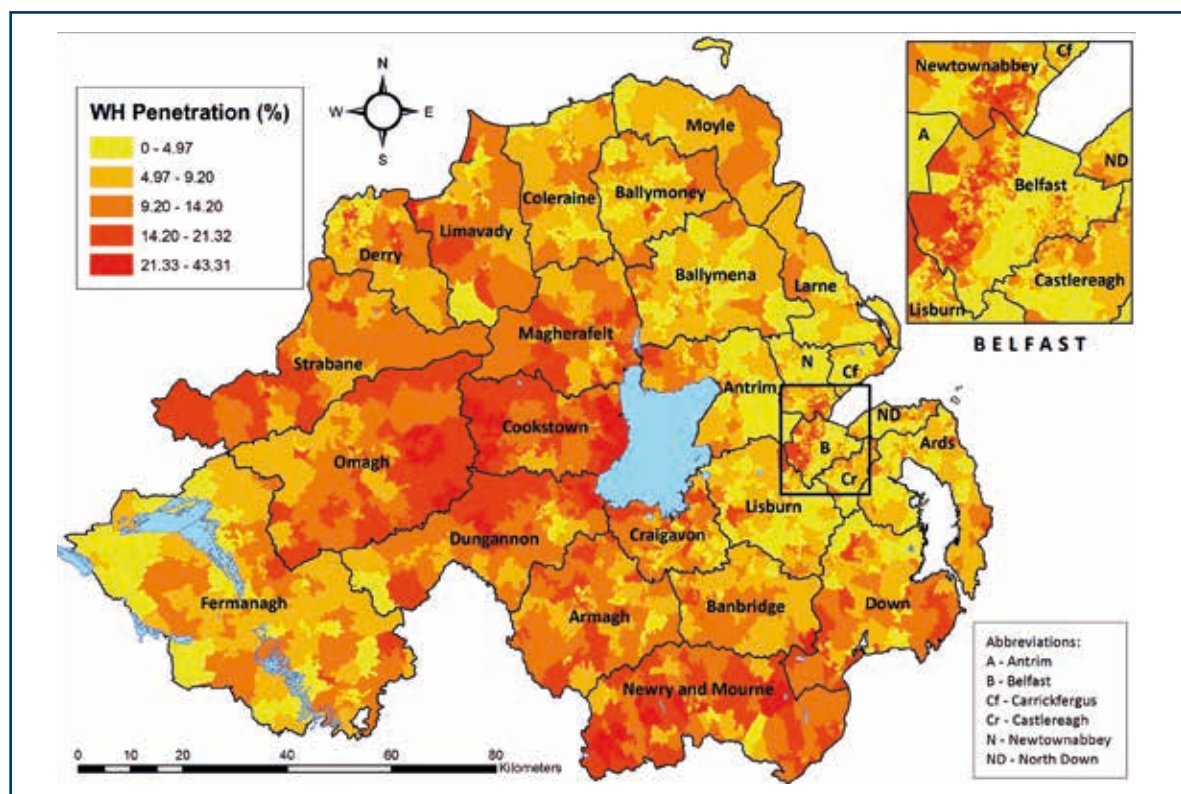
- In addition to enhancing accuracy of targeting, a GIS area-based approach circumvents the need to identify individual households as vulnerable, which has always risked stigmatizing people and may have prevented those most needy coming forward for assistance. Criteria associated with vulnerability could be maintained in an area-based approach (should the NI Fuel Poverty Strategy continue to endorse this), in that prevalence of elderly, children, and long-term disabled per COA could be entered into the algorithm, if desired.
- It must be noted that an area-based approach inevitably leaves fuel-poor households that are located in low-risk areas with little hope of assistance in the medium term. This raises ethical and political difficulties for any regional government, not least of all Northern Ireland

where area-based issues are sensitive. Phasing in an area-based approach until it reaches a point where it has parity with the current implementation programme is recommended. A two-track system of targeting, with individual- and area-based approaches operating in parallel could maximise cost-effectiveness whilst protecting those most vulnerable to fuel poverty and its effects wherever they are located in the region.

- It has been agreed that the survey used in the pilot will not be used again. It has served its purpose and has gathered data from a satisfactory number of

households. From now on, data collection will be more to do with assessing client eligibility, and establishing customer satisfaction. These will require less complex survey tools, and it is likely that both aspects of surveying will be completed electronically. This will cut down on the labour intensive work involved in printing and photocopying paper forms. It would also facilitate the fast and efficient delivery of surveys that could be sent through to a central server/ database for storage. Further research and consideration is required to clarify the requirements of such a system.

Figure 4.5. Spatial distribution of WH installations, shown as a percentage of all houses in a COA.



- Appreciation for how Councils operate and the protocols that they must abide by (since these take time to complete) is important. Future phases of the scheme that involve Councils should build in parameters to help facilitate changes that will be required over time. Improvement in communication will be key when it comes to keeping Councils enthusiastic about participation in future phases of the scheme.

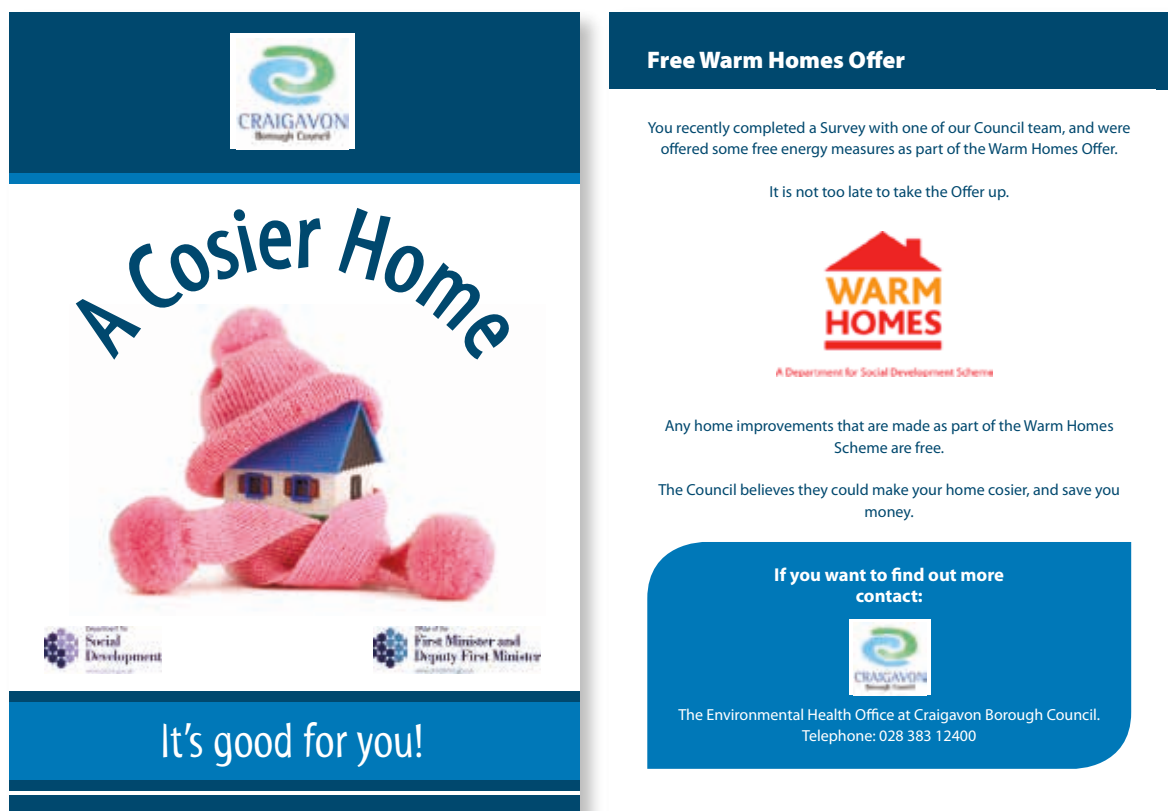
4.11 Plans for revisiting “Eligible Refusers”

Attempts were made by Councils to contact householders who did not go ahead with the installation work offered. It has been agreed with one

Council (Craigavon) that a process of ‘following up’ households who refused assistance will be implemented. A leaflet providing information to these households has been developed and will be sent shortly. Figure 4.6 gives details of some of the pages in the leaflet.

A plan to determine eligible refusers’ personal characteristics and the reasons why they refused is under development. It has been suggested that many households feel that there is some ‘catch’ and that central government cannot genuinely be trying to help them by giving them something for nothing. It is recommended that local community groups be used to counter this suspicion in future.

Figure 4.6. Follow-up leaflet for Eligible Refusers – sample pages



4.11. Conclusions

This is the most accurate tool for targeting fuel poverty that has been developed so far.

It is particularly appropriate for finding small pockets of severe and extreme fuel poverty.

It can locate these in all 26 Councils of Northern Ireland.

In any one COA which Councils work in, at least a quarter of households should be the target for WH installation.

Once these have works completed, there may be an opportunity to re-contact those who did not move forward to the technical survey stage, as well as those who cancelled work.

This fulfils the **Van in the Street** philosophy of area-based approaches and delivers:

- Help where needed most
- Economies of scale

- Local employment
- Community engagement
- Opportunities for holistic solutions in neighbourhoods.

If those who cancelled (8%), and those who could not be contacted for technical survey (13%) were to return to the Scheme, the successful target rate could reasonably be estimated to approach 50%.

The area-based approach has fulfilled many of the objectives set out in OFMDFM's Delivering Social Change framework; the approach targeted designated priority groups (children, older people, and those with disabilities), it focused on deprived areas with a view to providing mechanisms for physical regeneration, and it identified potential investment zones based on robust empirical evidence.

Chapter 5 Quarterly Deliverables

5.1 Progress on Deliverables in Quarter 1

1. Establishment of cost code and invoicing procedure.
2. Appointment of Project Steering Group (PSG).
3. Recruitment of Researcher and temporary research assistants.
4. Convening of first meeting of the PSG (February 2012).
5. Selection and recruitment of 4 participating Councils.
6. Agreement of a three-month plan of action for Quarter 2.
7. First approaches made to Council areas.
8. Co-opting of Council representatives onto PSG.
9. Development and testing of home survey materials.
10. Interim report completion.

Quarter 1 was scheduled to commence on 15th January although there was a slight delay in starting whilst the contractual protocol was completed. On contracts being signed, the project commenced on 20th February 2012. Most of the deliverables and milestones for Quarter 1 were completed despite this 5 week delay at the start.

1. Establish cost code and invoicing procedure

The grant was lodged with, and administered by, the University of Ulster's Office of Innovation.

Invoices were submitted to OFMDFM quarterly and in arrears.

2. Appoint Project Steering Group (PSG)

The core Project Steering Group was appointed and consisted of:

Jackie Barr, Principal Environmental Health Officer, Coleraine Borough Council

Jacqui Frazer, Coordinator, Northern Investing For Health Partnership

Michael MacNeill, Deputy Principal Statistician, OFMDFMNI, succeeded by Janis Scallon, Principal Statistician, OFMDFMNI

Trevor Martin, Chief Building Control Inspector, Belfast City Council

Oliver McHugh, Fuel Poverty Strategy, DSDNI

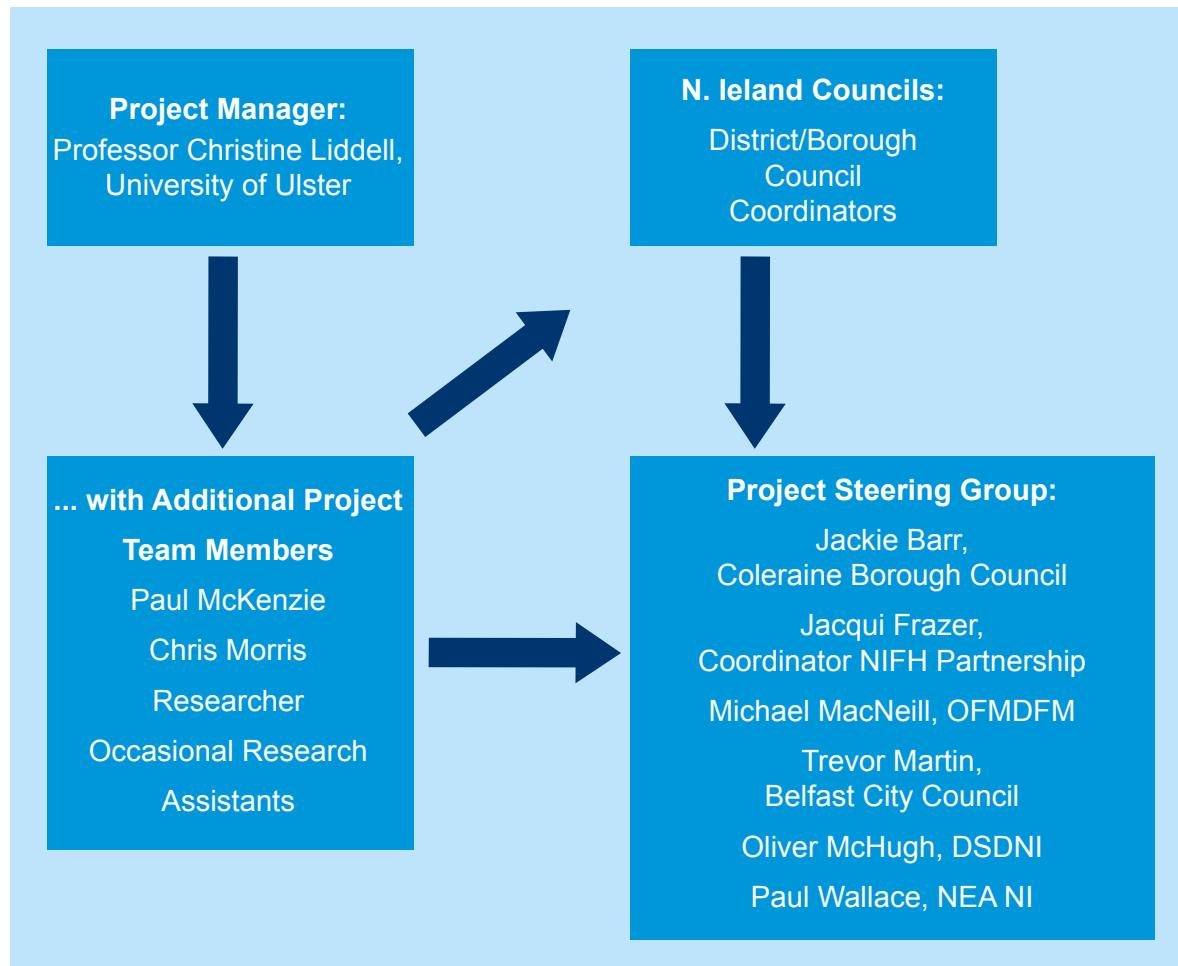
Paul Wallace, Development Manager, National Energy Action NI (NEA NI)

Noel Rice, Energy Conservation Manager, Northern Ireland Housing Executive

*Secretary to PSG:
Ryan Walker, University of Ulster.*

Project Governance for the project ultimately included all District/Borough Council Project Coordinators involved in the implementation of the pilot (See Figure 5.1).

Figure 5.1: Original Project Governance Structure.

**Notes:**

- Council Project Coordinators started with 4 participants, and increased to 18 full participants (additionally, one Council did not complete surveys, and we also had one Observer Council).
- The Research post was altered into several research assistance posts during the project, to cater for the increased number of Councils who were participating in the project. On many occasions, we required several personnel to be in different places at the same time, which a single appointment would not have permitted.
- Michael MacNeill was replaced by Janis Scallon (Principal Statistician OFMDFMNI) during the course of the project.
- Noel Rice, NIHE, joined the PSG during Quarter 2.

3. Recruitment of Researcher and temporary research assistants

Three temporary researchers were recruited to the project, two junior assistants (Susan Lagdon and Laura O'Neill) and a senior

researcher (Dr. Chris Morris). Provision for mapping assistance was also arranged with the appointment of a postgraduate student completing an M.Res. in Environmental Sciences at UU at the time of project commencement (Ryan Walker), as well as a Master's student training in mapping (Katie McFarland).

4. Convene first meeting of the Project Steering Group (PSG)

This took place at the Tullyglass Hotel, Ballymena, on the 22nd March, 2012.

5. Selection and recruitment of 4 participating Councils. Including first approaches to Council areas

DSDNI were interested in expanding the pilot beyond the agreed "4 or more participating Councils". They wanted it to be offered to all 26 Councils in Northern Ireland. As a consequence, they organised an information and dissemination event and invited 2 representatives from each of the 26 Council areas. This took place at Grosvenor House in February, 2012. As already noted, 19 Councils were included in the Pilot after this event.

These were as follows :

Armagh City and District Council
Ballymena Borough Council
Ballymoney Borough Council
Banbridge District Council

Belfast City Council
Carrickfergus Borough Council
Coleraine Borough Council
Cookstown District Council
Dungannon Borough Council
Larne Borough Council
Fermanagh District Council
Larne District Council
Limavady Borough Council
Lisburn Borough Council
Moyle District Council
Newry & Mourne District Council
Newtownabbey Borough Council
Omagh District Council
Strabane District Council

Later on, one of the Councils decided not to collect Surveys, so the final data were based on survey data from 18 Councils.

6. Agreement of a plan of action for Quarter 2

This was finalised in conjunction with the PSG, Councils, and DSDNI. It was agreed by all Councils that Banbridge District Council would launch the project first, so that any teething troubles could be ironed out there before going to scale.

7. First approaches to Council areas

See Section 5. and 6. above. In addition, a Synopsis of Literature concerning Affordable Warmth Strategies in English Councils was prepared by UU and circulated to all participating Councils. This provided baseline information to Councils on the wider remit of AW Strategies.

8. Co-opting of Council representatives onto PSG

This awaited clarification on which Councils would participate in the pilot.

9. Development and testing of home survey materials

Two members of the PSG (Wallace and Liddell) were part of the team that developed the home survey materials for a similar area-based project 18 months ago (the DARD-funded MARA Pilot). This was adapted and extended for use in the present pilot.

10. Interim report completion

Completed and submitted to OFMDFM for deadline of 31st March 2012.

7. Re-drawing of outcomes for targeting, to include Council's own data.

8. Interim report completion.

NEA arranged a day visit to Warm Zone (WZ) in Newcastle during this Quarter (staff attending from UU, NEA, and DSDNI). This was invaluable, since it provided us with information on many logistical aspects of the project. In particular, the process of contacting householders on the doorstep was discussed, including the use of a survey instrument to be used during these initial interviews. WZ had developed such a survey instrument and many aspects of it were adapted for use in the project. Experience from WZ in England suggested that this survey can be completed in 10 minutes at best, stretching to 30-40 minutes in some cases.

The initial contact with householders will be crucial to the uptake of assistance as experience shows that households are generally sceptical about coming into systems such as the Area-Based Approach. It was agreed that persons with good interpersonal and communication skills would need to be resourced for this task, and that a training program will need to cover the development of softer skills among home visitors.

The draft Survey and Consent forms were completed, piloted, and tested in this Quarter, ready for typesetting in Quarter 3.

5.2 Progress on deliverables in Quarter 2

1. Researcher commences full-time work on Project 1st April 2012.
2. Database building for all participating Council areas from Census and other sources.
3. Presentation of standard algorithm outcomes to all Council areas.
4. Second PSG meeting (May 2012), including sign-off on survey instruments.
5. Agreement on additional data to be added to database for each Council area.
6. Agreement on algorithm for each Council area.

Preliminary maps for each Council were made available with risk areas overlaid on ordnance survey maps; this made it easier for Councils to identify areas for targeting. Street maps of where houses were located were also provided on request. See Figure 5.2 for an example used by Banbridge in their Rathfriland targeting – Banbridge elected to use their 2nd and their 7th highest ranking COA's in terms of Eligibility scores (Rathfriland 2 and Rathfriland 7 – COA's 95FF150006 and 95FF150007 respectively).

Several presentations about the project were made by the UU team, at DSDNI's request, during this Quarter, for example:

- AGM of NI Council Building Control Managers.
- NI Fuel Poverty Partnership (preceded by a 45-minute meeting with Minister Nelson McCausland and his Special Adviser Stephen Brimstone).
- Partnership between UU, DSDNI and NEA teams continued to be constructive, responsive, and collaborative during this fast-moving phase of the Pilot.

1. Researcher commences full-time work on Project 1st April 2012

As explained in the previous Quarter's account, we appointed a larger complement of more junior research assistants instead. This complement of staff meant that multi-tasking was possible with staff carrying out different duties in parallel.

This proved more effective given the extended workload of the project.

2. Database building for all participating Council areas from Census and other sources

We signed a data sharing protocol with NIHE to facilitate data sharing. Following the exchange of layers of data that we needed from NIHE, we collated and mapped all the information from databases that are in the public domain, with the exception of valuation of house and age of house. The release of this information by LPS was imminent, and we wished to hold back for these data, since valuation and age are vital elements of the proposed algorithm for targeting. They arrived soon after Quarter 2 ended.

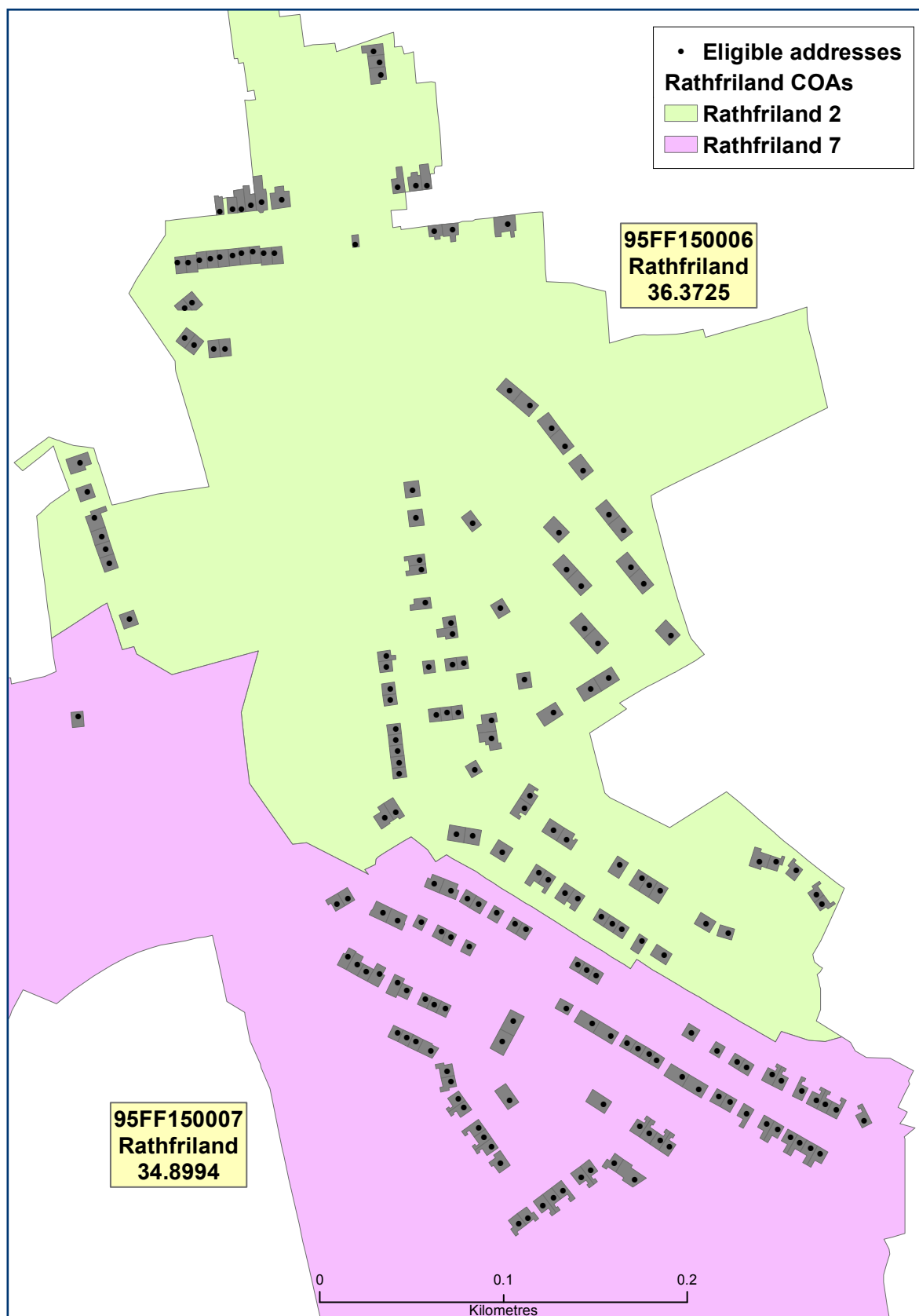
3. Presentation of standard algorithm outcomes to all Council areas

The first meetings with Councils took place in June 2012, with the last one scheduled for mid-August 2012. All other meetings were scheduled for June and July.

4. Second PSG meeting (May 2012), including sign-off on survey instruments

The second meeting took place in Belfast on the 6th June 2012. At this meeting the key responsibilities of the steering group were discussed.

Figure 5.2. Rathfriland homes for targeting



- The Group has a governance role to play in the project, providing clarity in the roles of the Department (DSDNI) and other main actors in terms of the logistics of, and delivery of the scheme.
- It is seen as a collaborative project, seeking to find agreement on issues so as to promote equality at all stages of delivery of the project (e.g. the allocation of measures to households).
- OFMDFM perceives its role to be both grant-maker and adviser to the project.

The survey instruments (including the consent form for householders) were finalised, piloted, and printed in Quarter Two. NEA built a flowchart for the Pilot, which is illustrated in Figure 5.3 overleaf. As this Figure illustrates, there were still many aspects of the delivery protocol that had not been confirmed at this stage. Most of these were related to the DSDNI/NIHE collaborations that had not, as yet, been fully agreed.

5. Agreement on additional data to be added to database for each Council area

None was required.

6. Agreement on final algorithm for each Council area

This was standardised across all participating Councils.

7. Re-drawing of outcomes for targeting, to include Council's own data

None was required.

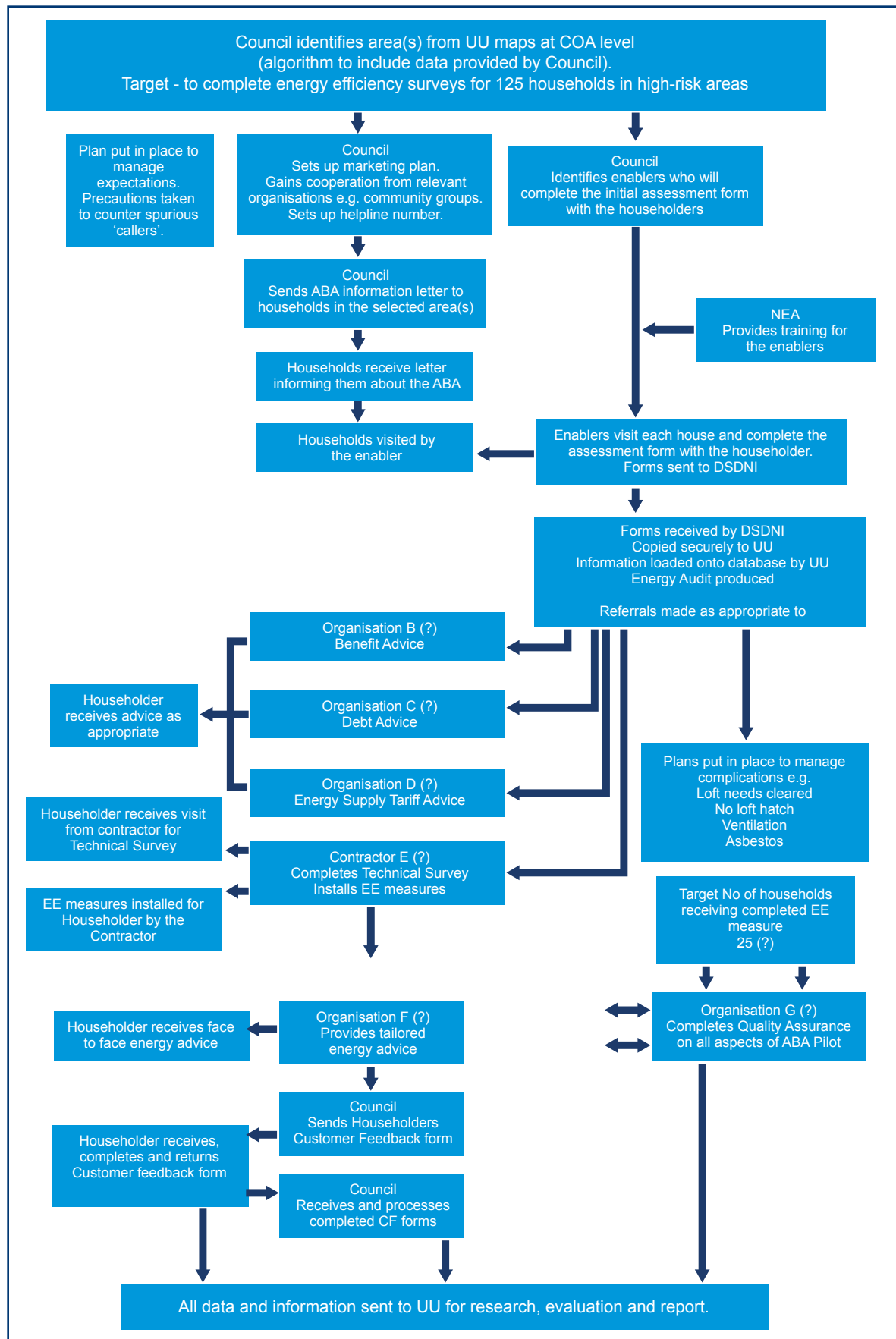
8. Interim report completion

Completed and submitted for deadline of 30th June 2012.

5.3 Progress on deliverables for Quarter 3

1. Agreement on plan of action for recruiting households in each Council.
2. Training of delivery teams and on-going support for these teams.
3. Testing and roll-out of delivery protocol.
4. Home visits to households in target areas.
5. Referral onwards to other agencies.
6. Third PSG meeting (August 2012).
7. Debriefing of home visit teams fortnightly, for recalibration purposes.
8. Amendments and additions to home visit protocol as needed from debriefing sessions.
9. Interim report completion.

Figure 5.3. Research protocol



1. Agreement on plan of action for recruiting households in each Council

The top 10 most eligible COA's for the Affordable Warmth Pilot were provided to 18 Councils, along with maps and analysis. Thereafter:

- Meetings were held with 12 Councils to discuss their top COA's and select a short-list of 4 for Survey. Some Council's requested more COA's and more detailed analysis, which was provided as needed. Postal addresses were sourced for each Council's selected COA's, and also for a further 4 Councils who did not require any meetings to make their decision.
- These postal addresses were manually filtered for house value before being sent out to Councils – this is intended to minimize the likelihood that more affluent/valuable homes are targeted in the Pilot; this was especially important for some rural COA's where housing quality was mixed.
- Together with colleagues from NEA NI, a leaflet was designed for inclusion with householder letters. Each Council received 600 of these Customer Contact Leaflets entitled "A Warmer Home that saves you energy". The 4-page leaflets were then posted – together with

a letter from the Council
- to the address lists UU had generated from each Council's chosen COA's. A week later, Council teams made visits to these COA's and attempts were made to contact householders at all addresses which had received a leaflet.

- In addition, for each householder who completed the survey, householders were provided with:
 - A "What Happens Next" card
 - Energy Efficiency information pack
 - 2 low energy light bulbs
- If people were out, a calling card was left, indicating that the Council had called about the "A Warmer Home" scheme, and giving a number to call in order to arrange a return visit. If householders were home, the survey was completed by the enabler and the "What happens next card" was left with the householder. These materials ensured that the household was kept up-to-date and informed as well as practically possible. Opposite are some examples of these materials.

Figure 5.4. FRONT AND BACK page of leaflet

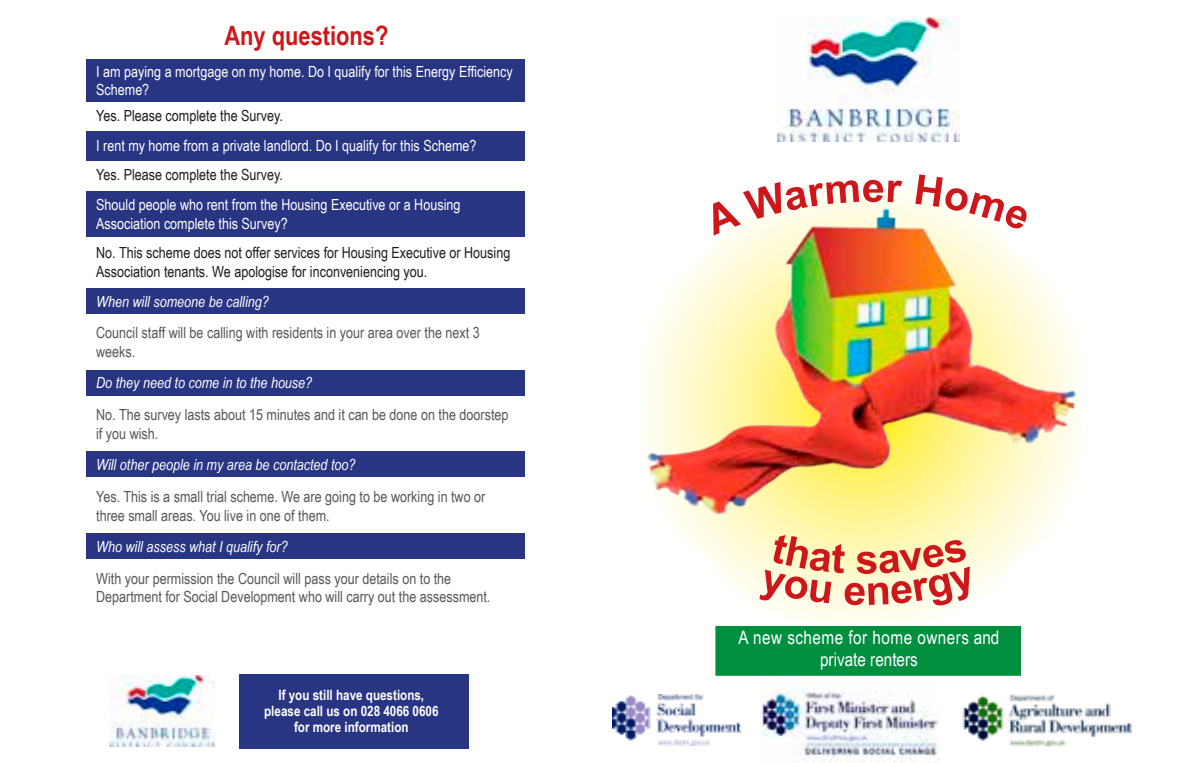


Figure 5.5. INSIDE pages of leaflet

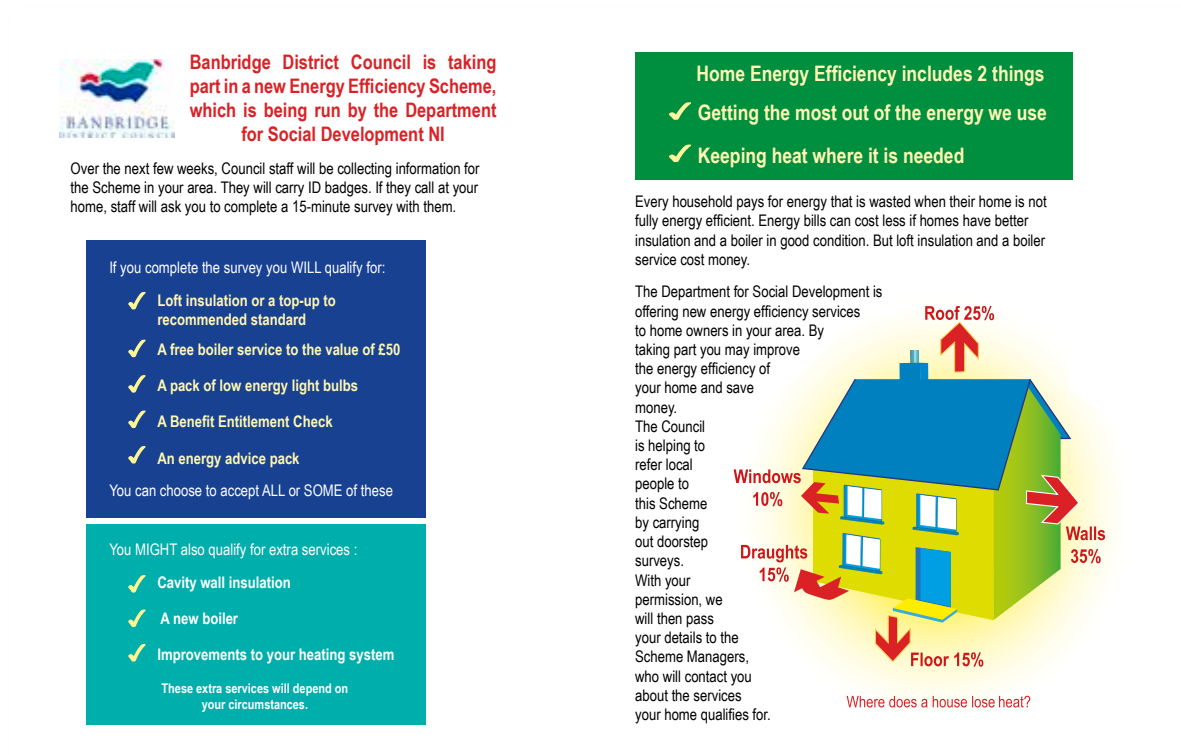


Figure 5.6. Calling card



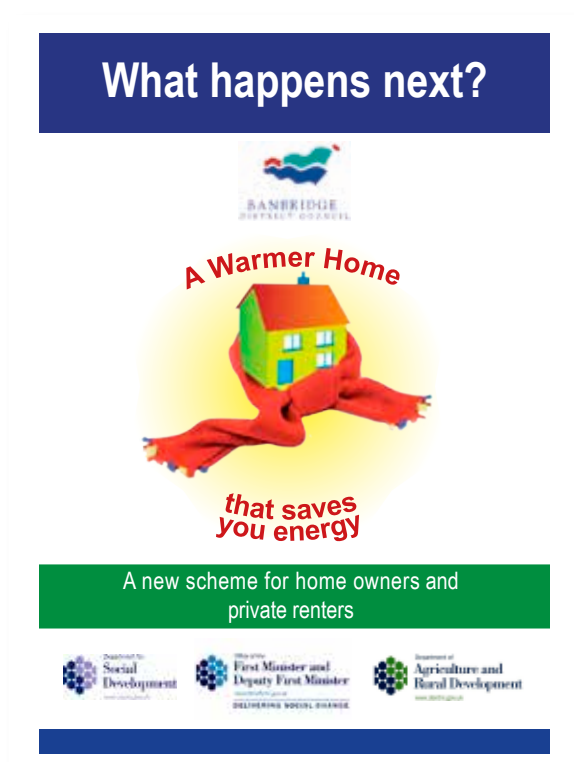
We wrote to you recently about a new Energy Efficiency Scheme that the Council is taking part in. A Council worker called with you today to complete a Doorstep Survey, but there was no reply. We may call back again in the next few days, and we hope to be able to see you then.



Where does a house lose heat?

If you have any queries, please contact us on
028 4066 0606

Figure 5.7. What Happens Next? card



**Many thanks for
completing
the Survey**



To protect your identity and personal details, the form that the Council worker filled in with you does not have your name or address on it. You are identified only by a number on the form.

The form will be sent to the Department for Social Development who will assess what energy efficiency measures you may be eligible for. They will then write to the Council with the results of the assessment.

Following this, the Council will send you a letter **within 30 days** explaining what measures you may be eligible for, and what your choices are. This will include details of local businesses who you can contact to service your boiler, if you have a boiler that requires a service. You will not have to pay them to carry out the service. They will be paid by the Department for Social Development.

If you have requested advice on benefit entitlements, then we will pass your name and contact details to the relevant team at the Department for Social Development. They are usually able to carry out a benefit entitlement assessment with people over the telephone.

If you have any questions, please contact the Council
at 028 4066 0606

Belfast City Council requested that the City be divided into 4 areas (N/S/E/W) and that maps be drawn and postal addresses extracted for all 4. This increased the scope of the project from 18 sets of COA's for participating Councils to 21 sets.

2. Training of delivery teams and on-going support for these teams

- The University team developed a range of support materials for the Survey teams, including picture cards and large print versions of the Surveys. These materials were developed in order to ensure that the door-step interview ran smoothly and householders could have an easy and stress-free experience.
- Banbridge began surveys first and we held a one-day training session with their 3 elected Surveyors (2 placement students and one Environmental Health Officer) at the UU's Coleraine campus. The training session covered an introduction to the pilot, aims, targets etc., the Survey and how to collect the required data, all aspects of health and safety on the door-step, effective listening skills and good communication when conducting surveys.
- We visited their Survey team once a week to establish quality control and resolve problems. The Banbridge

team also had continuous open channels to the University team via mobile and email.

- Similar support for Armagh Council – who also launched during this Quarter - was provided on their first day of Surveying.
- Together with our NEA colleagues, a further 2 Survey training days were run, one in Belfast and one in Cookstown – these were attended by 40 personnel from 15 Councils.
- On the 14th September a final training scheme for newly arriving placement students was provided– 22 students booked onto this, along with some of their line managers. In total, we estimate to have trained almost 70 Council and placement personnel to carry out the Surveys.

A copy of the Training Day programme is contained in Figure 5.8 (overleaf).

- A personal safety guide for Councils who intend to use placement students as Surveyors was also provided.

Figure 5.8. Programme for Training Days

	
Affordable Warmth Pilot Training Day for Placement Students 14th September 2012	
Agenda	
10h45 to 11h15	Arrivals and welcome
11h15 to 11h40	Introducing Affordable Warmth and the Pilot Project Christine Liddell
11h40 to 12h00	Introducing GIS mapping – from maps to addresses Paul McKenzie
12h00 to 12h10	Comfort break
12h10 to 13h00	The Survey Paul Wallace and Christine Liddell
13h00 to 13h30	Lunch
13h30 to 14h15	Soft skills Paul Wallace
14h15 to 14h45	Keeping safe and sound: Experiences on the doorstep Susan Lagdon and Laura O'Neill
14h45 to 15h00	Discussion and wrap-up

3. Testing and roll-out of delivery protocol

- We brokered a system of auditing the Surveys with Bryson Energy, and adapted the Survey until it was fully compliant with their Warm Homes auditing software.

4. Home visits to households in target areas

- 160 surveys were collected at this stage by 2 Councils (Banbridge and Armagh), with Banbridge having almost completed their quota of 125 surveys.
- An additional training and information day for all Councils was hosted by DSDNI in Craigavon at the end of August to provide final guidelines and materials ahead of a wider roll-out. Most Council's planned to commence surveying in the week commencing 17th September.

5. Referral onwards to other agencies

- Final agreements on the referral and installation protocols were still in the discussion and planning phase at DSDNI, but processing of the Surveys was kept up to date notwithstanding.
- The first 110 Surveys from Banbridge and Armagh were forwarded to Bryson Energy for pilot auditing. The remainder would be

forwarded to a lead agency for audit, once the lead agency for auditing had been decided upon. (Bryson Energy were eventually sub-contracted to UU for this auditing role, and carried out a portfolio of responsibilities in that capacity. Their work was exemplary in every respect, and greatly facilitated the project).

- Bryson Energy informed UU of the outcomes for Banbridge and Armagh Councils. The results were then edited and transferred to the Councils by UU, with guidelines on the next steps.

6. Third PSG meeting (August 2012)

- So that clarity could be gained on the referral protocol, this meeting was postponed until the 13th September.

7. Debriefing of home visit teams fortnightly, for recalibration purposes

- This was done on a weekly basis with Banbridge, but proved unnecessary with Armagh who encountered no difficulties that we could discern when carrying out their Surveys. We still planned to provide assistance to Council teams if they requested it, once they commenced their Survey work from mid-September onwards.

8. Amendments and additions to home visit protocol as needed from debriefing sessions

- The home visit protocol (Survey) was in its sixth iteration, following the piloting with Banbridge Council and reviews by Bryson Energy as described above.
- Interim report completion: Completed for deadline of 30th September 2012.

5.4 Progress on deliverables in Quarter 4

1. Fourth PSG meeting (November 2012).
2. Completion of all home visits and referrals by Council teams.
3. Final debriefing of home visit teams.
4. Objective 2: Building of Warm Homes installation database (2000-2012).
5. Workshop organisation and conference participation.

1. Fourth PSG meeting

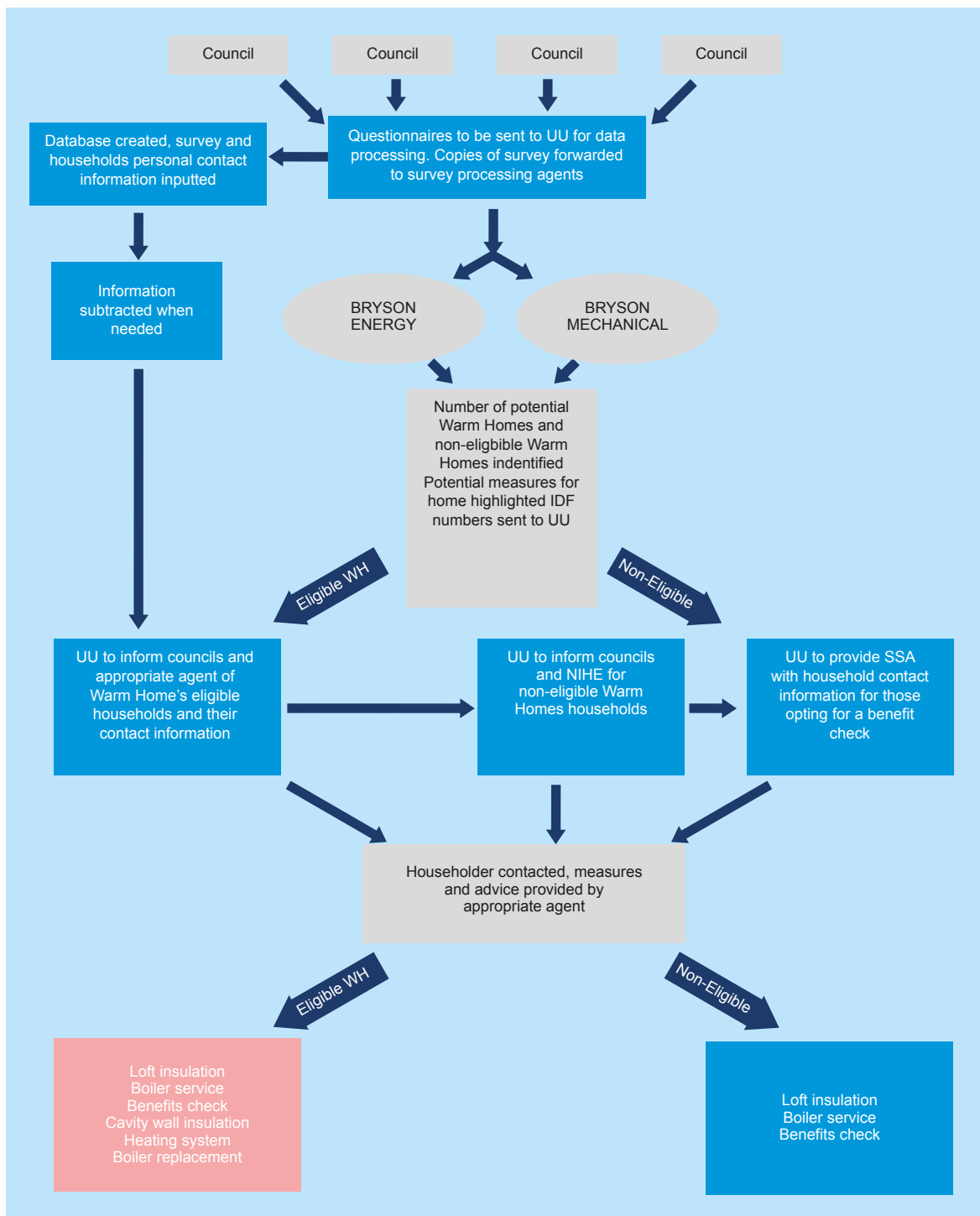
The Fourth Project Steering Group meeting was held on the 4th December 2012. Discussions focused on feedback from Councils on their experience with the project. The final referral protocol was also agreed, covering all aspects of the process from the Council survey through to the installation of heating and insulation by Warm Homes agents, and the provision

of loft top-ups and boiler services by NIHE.

- Individuals found to be 'eligible' under the Warm Homes scheme to be dealt with by this agent and assessed in accordance with the normal application process to this scheme.
- Households that are identified as 'not eligible' under the Warm Homes scheme to be referred to NIHE following protocol set by DSDNI. This will ensure that all households taking part in the pilot receive a return for the time taken to complete the Survey. Consenting participants also to be referred onwards to Social Security Agency for benefit checks, and then rerouted back into Warm Homes if any additional benefit is a passport benefit into Warm Homes.

Figure 5.9 illustrates the complete protocol.

Figure 5.9. Overview of the referral process



2. Completion of all home visits and referrals by Council teams during the Fourth Quarter

Twelve Councils completed and returned all surveys to UU during this Quarter.

3. Final debriefing of home visit teams

Largely positive feedback was received by councils; the area-based approach gave Councils the opportunity to reach households that they could not reach before. However, the selection of some areas for inclusion in the Pilot came as a surprise to some Councillors and Environmental Health teams, as they were not necessarily the 'poorest' areas. The objective selection process (using maps) had to be explained to Councillors in some detail in order to obtain their approval for the targeting.

4. Building and analysis of Warm Home's installation database (2000-2012)

The Warm Homes installation database was collated and analysed during this Quarter. The database contained information on each Warm Homes installation undertaken in Northern Ireland between 2002 and 2011 (approximately 76,000 households). The 2002-2009 (58,868 households) data, contained the more detailed information, e.g. on the types of measures installed in each home, along with the cost of

measures. Data were aggregated to COA level and areas where Warm Home's activity and expenditure was concentrated were analysed in terms of demographic and accuracy of targeting.

5. Workshop organization and conference participation

As requested by Councils and DSDNI, these were replaced with Training Days for Council Survey teams. Four of these were held over the space of 2 months, with NEA NI and UU partnering each other in delivering the day's programme. In total, they were attended by more than 70 people.

5.5 Progress on deliverables for Quarter 5

1. Evaluation of results from Objective 1.
2. Analysis of Warm Homes installation database (2000-2012).
3. Fifth PSG meeting (February 2013).
4. Comparison of targeting efficacy of area-based and Warm Homes installations.
5. Interim report completion.

1. Evaluation of results from Objective 1

18 Councils took part in the pilot and 2,145 households were assessed. Of these, 2,141 households gave their consent to have their assessment surveys analysed by the University. The University of Ulster team have produced profiles from these surveys. Provisionally, the profile analysis indicates that most households are in severe or extreme fuel poverty – a clear indication of better targeting. Rich information emerged from the Survey, and is already being deployed by Councils and DSDNI for forward planning. This more than justified the multi-faceted and in-depth nature of the survey itself, the purpose of which was to gather as much data as possible concerning people living in severe or extreme fuel poverty, as well as to identify the characteristics of households not being reached by Warm Homes.

2. Analysis of Warm Home's installation database (2000-2012)

A copy of the paper which was submitted to the journal Energy Policy for peer review is contained in Appendix 3.

3. Fifth PSG meeting

The fifth PSG meeting was held on the 7th March 2013 in Belfast. Discussions during the meeting focused on survey results and exploring possible next steps following the completion of the project.

4. Comparison of targeting efficacy of area-based and Warm Homes installations

This awaits final results from the Council installations, not all of which have been completed by Warm Homes agents yet.

- Interim report completion: submitted for the deadline of 31st December 2012.

5.6 Progress on deliverables for Final Phase (two months)

1. Final analyses and report write-up for Objectives 1 and 2.
2. Final PSG meeting (May 2013).
3. Workshop organisation and conference participation.
4. Final report writing and submission.

1. Final analyses and report write-up for Objectives 1 and 2

This has been completed as far as it can be, but awaits final installations from Warm Homes contractors and NIHE. A final customer journey profile is shown on Figure 5.10.

2. Final PSG meeting

It is proposed that the final PSG meeting is held in December 2013, since not all installations have been completed by contractors and NIHE as yet.

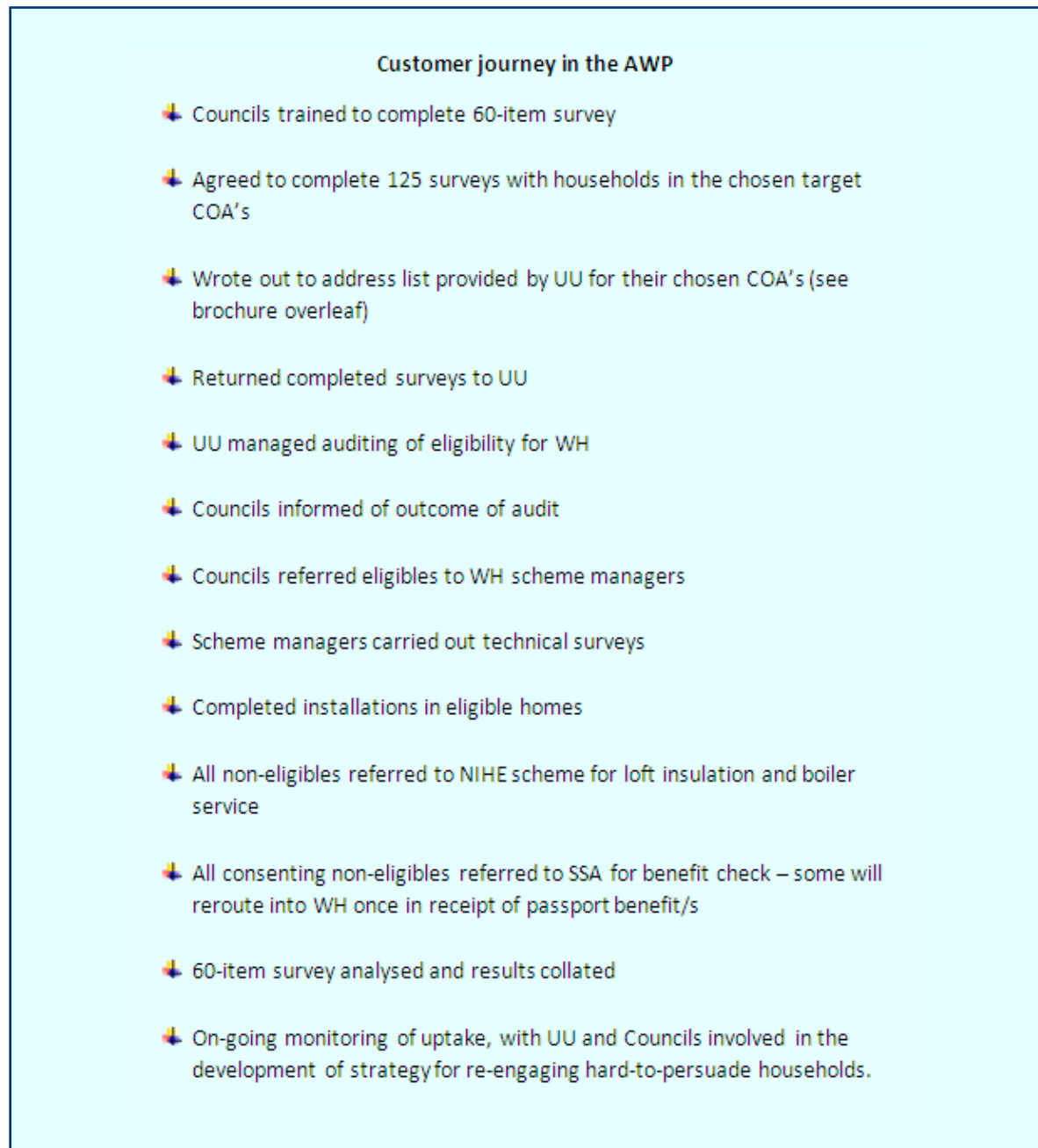
3. Workshop organisation and conference participation

- UU has applied to UKERC for permission to use conference facilities at the University of Oxford, so that these results can be disseminated at an event for 60 academics and policymakers in England.
- OFMDFMNI have requested a presentation based on the project at their Delivering Social Change Event in June 2013.
- OFMDFMNI have requested a presentation to OFMDFM officials in August 2013.
- DSDNI are planning a series of workshops and seminars to be held with all 26 Councils in Northern Ireland between June and July 2013; UU is expected to present the findings of the project at these, and is also expected to assist the Councils in the launch of a second phase of the area-based targeting approach.

4. Final report writing and submission

The present report comprises the final report.

Figure 5.10. Customer journey in the Project



Acknowledgments

- Office of the First and Deputy First Minister NI for funding and advice throughout the project
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- Katie McFarland and Ryan Walker, UU, for map generation and address sourcing, and Susan Lagdon, UU, for survey collation and input, Laura O'Neill for general research assistance.
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- NIHE, LPS, and the UK Meteorological Office for providing data that was needed for algorithm development and testing
- Paul Wallace, National Energy Action NI, for assistance in the design of survey materials, and in training Council Survey teams
- The Environmental Health and Building Control teams of 18 local Councils in Northern Ireland, and the teams at NIHE and SSA for processing referrals
- The Project Stakeholder group for advice and guidance during all quarterly meetings
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